

**EXHIBIT 42**  
**Filed Under Seal**

**REBUTTAL DECLARATION OF MEREDITH ROSENTHAL IN SUPPORT OF THE CERTIFICATION OF  
THE CLASS OF DIRECT PURCHASERS OF DIOVAN, NEXIUM, AND VALCYTE**

**United States District Court, District of Massachusetts, *In Re Ranbaxy Generic Drug  
Application Antitrust Litigation*, MDL No. 19-md-2878-NMG.**

**March 22, 2021**

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## I. EXECUTIVE SUMMARY

1. I have been asked by counsel for Direct Purchaser Plaintiffs (DPPs or Plaintiffs) in this matter to respond to the rebuttal report of Dr. Bruce Stangle.<sup>1</sup> In my previous report<sup>2</sup> I found that class member injury could be demonstrated using common economic evidence. Further, I developed and implemented a class-wide methodology based on standard economic practices for quantifying overcharges incurred by DPPs as a result of the alleged misconduct. Dr. Stangle attempts to undermine my conclusion that Class-wide impact can be shown using common evidence by mischaracterizing normal variation in DPP prices. He then proceeds to undertake a conceptually inappropriate and computationally flawed individualized analysis that he claims shows uninjured class members. In this analysis, Dr. Stangle introduces what I have been instructed are unfounded legal assumptions; he also makes adjustments to my yardsticks that I disagree with on economic grounds. Dr. Stangle's analysis and resulting conclusions are simply incorrect and I do not change my opinions from my affirmative report.

## II. INTRODUCTION

2. My name is Meredith B. Rosenthal. I am the C. Boyden Gray Professor of Health Economics and Policy at the Harvard T.H. Chan School of Public Health and an Academic Affiliate of Greylock McKinnon Associates ("GMA"), a consulting and litigation support firm. My principal research interests concern the economics of the health care industry. My credentials have been previously submitted to the Court with my initial report; however, Attachment A contains my updated CV. Attachment B is a list of additional materials I have relied upon in this declaration.

3. In my affirmative report, I showed that class member injury can be demonstrated using common economic evidence. I developed and implemented a class-wide methodology based on standard economic practices for quantifying overcharges incurred by DPPs as a result of the alleged misconduct. I applied this model using data produced by brand and generic

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<sup>1</sup> Expert Report of Bruce E. Stangle, Ph.D., *In Re Ranbaxy Generic Drug Application Antitrust Litigation*, MDL No. 19-md-2878-NMG, February 10, 2021 (hereafter Stangle Report).

<sup>2</sup> Declaration of Meredith Rosenthal in Support of the Certification of the Class of Direct Purchasers of Diovan, Nexium, and Valcyte, *In Re Ranbaxy Generic Drug Application Antitrust Litigation*, MDL No. 19-md-2878-NMG, November 2, 2020 (hereafter Rosenthal Report).

manufacturers of the three drugs at issue in this matter. I was asked by counsel to assume that the jury may determine one of a range of entry scenarios absent Ranbaxy's misconduct – two each for Diovan and Nexium and one for Valcyte. As I mentioned in my affirmative report, this methodology can accommodate new data, which, indeed, I have demonstrated below by updating my results in light of newly produced Nexium data. Should further proceedings require additional assumptions as to the range of jury determinations, my model can be adjusted to account for any number of different scenarios based on newly discovered facts or further developments or changes to but-for generic entry dates.

### **III. CLASS-WIDE OVERCHARGES CAN BE CALCULATED USING COMMON PROOF AND DO NOT REQUIRE INDIVIDUALIZED INQUIRY**

4. The primary assertion of Dr. Stangle's report is that "Pharmaceutical payments are complex and generally require individualized analysis"<sup>3</sup> and further that "[t]here is substantial variation in direct purchaser prices, particularly for generics."<sup>4</sup> He claims that my aggregate overcharges analysis masks this variation and as a consequence the proposed class includes a significant number of uninjured class members. Dr. Stangle is incorrect that price variation in this case precludes the use of an aggregate overcharges model; indeed, the price variation here is typical for prescription drugs. As I have shown in my affirmative report, due to the dramatic differences in the actual and but-for prices faced by the class members, all or nearly all were injured by the alleged conduct. Furthermore, Dr. Stangle fails to show that individual class members did not sustain overcharges, as he claims.

5. In my affirmative report, for all scenarios, I used common evidence to show that the but-for generic price was substantially below the actual brand price, leading to significant brand-generic aggregate overcharges. Similarly, I showed significant aggregate overcharges for brand purchases of Diovan and Nexium that would have remained brand purchases but at lower prices, and for generic purchases of all three generic drugs. The common proof used includes the sales data produced by the manufacturers of all of the brand and generic drugs in this matter, corporate forecasts of generic entry, and the academic literature. The manufacturer forecasts and

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<sup>3</sup> Stangle Report, p. 26.

<sup>4</sup> Stangle Report, p. 34.

the academic literature support the proposition that generic entry causes dramatic shifts in market share to the generics (*i.e.*, about a 88 to 97 percent shift from brand units to generic units),<sup>5</sup> and declines in the prices (*i.e.*, ultimately about a 90 to 97 percent drop from the pre-generic launch brand price),<sup>6</sup> paid by direct customers. These expectations were borne out by data showing actual sales after the (delayed) relevant generic launches in this matter. Generic market shares reached over 95% for Diovan generics and Nexium generics, and 90% for Valcyte generics.<sup>7</sup> Generic prices declined over 95% for all three generic drugs.<sup>8</sup>

6. Dr. Stangle appears to fundamentally misunderstand the standard economic methodology for calculating generic pricing trends and applying those trends to an alternative but-for scenario. The academic literature is clear that one should analyze generic pricing trends based on the pre-generic launch brand price.<sup>9</sup> Using such trends, researchers can compare the relative magnitude of these trends across drugs or across varying scenarios of the number of generic manufacturers. One should note that the academic research does not go about such inquiries by comparing *price levels* across drugs or situations of varying generic entrants. This is intuitive: a brand drug with a pre-generic launch price of \$1000 would have much higher generic prices than a brand drug with a pre-generic launch price of \$50. And generic prices for such drugs would likely never converge. This is an extreme example, but the logic is the same for the calculation of but-for prices and overcharges. All else equal, a but-for generic price calculated off of a pre-generic launch price of [REDACTED] per pill will be much less than the actual generic price that was priced off of an actual pre-generic brand price of [REDACTED] (this is the situation with Diovan Scenarios 1 and 2).<sup>10</sup> Furthermore, given that the starting price is much lower, an increase in the number of generic entrants in the second case will cause the two price series to diverge even further. At some point, the actual and but-for generic prices at wholesale may converge, and when they do

<sup>5</sup> See Rosenthal Report, ¶¶ 51-56 and Figures 8-11.

<sup>6</sup> See Rosenthal Report, ¶¶ 40-46 and Figures 1-4.

<sup>7</sup> See Attachments C.2, C.4, D.2, D.4 and E.2.

<sup>8</sup> *Ibid.*

<sup>9</sup> See, for examples, H.G. Grabowski, *et al.*, “Updated Trends in U.S. Brand and Generic Drug Competition,” *Journal of Medical Economics*, 19(9), 2016, pp. 836-44, and R.G. Frank and R.S. Hartman, “The Nature of Pharmaceutical Competition: Implications for Antitrust Analysis,” *International Journal of the Economics of Business*, 22(2), 2015, pp. 301-343.

<sup>10</sup> See Attachments D.3 and D.5.

in my data, I have terminated my overcharge calculations. This methodology is sound, and yet Dr. Stangle characterizes it as merely an “artifact” of a “mechanical approach.”<sup>11</sup> This is a mathematical process, but it is rooted in sound economic theory and methodology, widely accepted academic research, and is based on the use of actual manufacturer sales data. These are the aspects of common proof that allow me to conclude that all or nearly all class members were injured by the challenged conduct. Dr. Stangle does not acknowledge this, and his incorrect inferences appear to drive other analytical errors, as I discuss below referring to Dr. Stangle’s flawed analysis of variation and in Section IV.

7. Dr. Stangle does observe variation in prices, but fails in his attempt to show that this variation is such that it results in zero or negative overcharges for direct purchaser class members. To show this, Dr. Stangle attempts to calculate overcharges individually for each direct customer. His analysis is flawed both conceptually and technically. Conceptually, my assignment was to determine whether or not common economic evidence exists and can be used (a) to determine whether all or substantially all members of the proposed classes were impacted by the wrongful conduct, and (b) to quantify on a class-wide basis the impact of the alleged conduct that delayed generic entry for each of the three drugs. My earlier analysis concluded that the alleged generic foreclosure impacted all Class members through the same mechanism: the absence of a generic alternatives. In reaching that conclusion, it is neither necessary nor helpful to attempt a class member by class member estimate of each member’s overcharges. Therefore, the concept of individualized overcharges is irrelevant to my assignment. Moreover, the manufacturer sales data and the aggregate overcharges calculation that I have used are the best means for quantifying class-wide overcharges. I have shown that common class-wide evidence exists to establish that all or virtually all class members were injured.

8. I understand that counsel for the Plaintiffs intend to show that individualized inquiry is not warranted in this matter, despite Dr. Stangle’s assertions. Even if individualized inquiry were warranted here, Dr. Stangle’s purported methodology to calculate overcharges separately for each individual class member is technically flawed. He incorrectly claims that he has applied my methodology for each customer, and he concludes that he has found that an individualized

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<sup>11</sup> Stangle Report, ¶ 73.

analysis shows that many class members had “zero” or “negative” overcharges.<sup>12</sup> His conclusions are incorrect for several reasons. First, I understand from counsel that as a legal matter, a class member can be shown to have been impacted by the alleged conduct if at least one transaction suffered an overcharge. Though I do not agree with Dr. Stangle’s calculations, as I discuss in detail in the following paragraphs, many customers in his own summary exhibits that he claims were not injured did, indeed, have at least one month of overcharges. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED].<sup>13</sup>

9. Second, Dr. Stangle misleadingly presents the customers with “zero” overcharges for each of the overcharge categories, brand-brand, brand-generic and generic-generic. He asserts that customers that are known to have only purchased the brand or only the generic have no generic-generic overcharges or brand-brand overcharges, respectively. This observation, however, does not suggest that my aggregate analysis might be overlooking customers with zero overcharges. Of course brand-only customers would have no generic-generic overcharges, and vice versa. Pointing this out is merely an attempt to mislead. For example, in his Exhibits 12A and 12B, he indicates that Meijer had \$0 overcharges for brand-brand and brand-generic overcharges – this is because Meijer did not purchase brand-name Diovan, not because Meijer’s purchases of the brand showed zero overcharges. Moreover, Meijer had generic-generic overcharges of over \$700,000, according to Dr. Stangle’s own calculations. Dr. Stangle incorrectly suggests that class members need to have overcharges *in each category* of overcharge, but this is simply not true. Despite Dr. Stangle’s attempt to include Meijer in his false category of putative class members with zero overcharges, Dr. Stangle’s own methodology indicates that Meijer was injured by the challenged conduct by virtue of positive generic-generic overcharges.

<sup>12</sup> See Stangle Report, Exhibits 8A, 8B, 12A, 12B, and 16.

<sup>13</sup> *Ibid.*



10. Third, there are several false assertions in Dr. Stangle's exhibits in which he color-codes customers. He falsely asserts that "[c]ustomers highlighted in blue represent generic-only purchasers that Dr. Rosenthal implicitly and wrongly assumes made brand purchases" and "[c]ustomers highlighted in green represent brand-only purchasers that Dr. Rosenthal implicitly and wrongly assumes made generic purchases." Both assertions are incorrect. I did not assume that these customers made brand or generic purchases where the data show they did not. All customers are included in the aggregate purchase volumes calculated by my model, and the yardsticks are applied to those aggregate totals, as described in my affirmative report. There is no implicit assumption that the aggregate yardstick analysis requires each individual customer to have been impacted in an identical fashion, just because injury occurred through a common mechanism. Most importantly, my aggregate model shows that the Class in fact paid more for the brand and/or generic products at issue than they would have absent the challenged conduct in the but-for world.

11. Fourth, Dr. Stangle's calculations are in error. For example, many of the customers mentioned in his exhibits are highlighted in yellow to indicate that, according to Dr. Stangle, they "have \$0 damages due to insufficient data to apply Dr. Rosenthal's methodology."<sup>14</sup> In reality, what this means is that Dr. Stangle failed to calculate but-for prices for the months in which a customer actually made purchases. For example, in Diovan Scenario 1, Dr. Stangle shows that [REDACTED] made actual purchases of generic Diovan between July 2014 and November 2014 (which it did). Dr. Stangle then appears to calculate [REDACTED] but-for generic prices that would have occurred from October 2012 to February 2013. When he "backcasts" the sales of generic product in this way, Dr. Stangle fails to calculate the contemporaneous but-for prices for the months of actual purchases. Instead, he claims that he does not have a but-for generic price to match up with [REDACTED] actual purchases made from July 2014 through November 2014. The yardstick approach, however, requires that we also calculate but-for prices that [REDACTED], or any generic purchaser, would have paid in the same calendar months as the actual purchases. Using this approach, my model shows that if generic entry had occurred earlier, the prices [REDACTED] [REDACTED] would have paid for the generic from July 2014 to November 2014 would have

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<sup>14</sup> *Ibid.*

been much lower than those it actually paid. In other words, [REDACTED] has actual sales receipts showing purchases made on particular dates at particular prices, and my overcharges model shows that those prices would have been lower absent the challenged conduct. If Dr. Stangle had instead applied the generic price yardsticks in a comparable manner to what I do in my overcharges model, he would have found a much lower but-for generic price and substantial generic-generic overcharges. However, Dr. Stangle does not evaluate a but-for price for [REDACTED] actual purchases at the time they occurred. Instead, he appears to presume that [REDACTED] purchases would have occurred earlier in the but-for world and since this customer only purchased the product for a few months, Dr. Stangle's but-for sales for this customer do not overlap in time with the actual purchases made. Dr. Stangle repeats this error numerous times for both generic-generic and brand-brand customers. As such, Dr. Stangle's calculations and any conclusions drawn from them are meaningless.

12. In summary, I note that all or nearly all of the customers in Dr. Stangle's flawed analysis had either positive total overcharges, at least one month of overcharges across the three overcharge categories (brand-brand, brand-generic and generic-generic), or suffered from the analytical mistakes described above.<sup>15</sup> Thus, even by Dr. Stangle's own flawed calculations, all or nearly all class members were impacted.

#### **IV. DR. STANGLE'S ADJUSTMENTS TO OVERCHARGES ARE INCORRECT AND MISLEADING**

13. Most of Dr. Stangle's adjustments to my overcharge calculations are based on incomplete or misleading analysis of the data. I address many of his assertions below. With only minor exceptions, I find that none of Dr. Stangle's arguments dictate any changes to my methodology. In this section, I have also updated my Nexium models by using newly produced data (that Dr. Stangle did not use) and excluded brand-only consumers from my Valcyte calculation, which has a *de minimis* effect on Valcyte overcharges.<sup>16</sup>

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<sup>15</sup> *Ibid.*

<sup>16</sup> See Attachments D and E to this declaration. For completeness, I have also included the Diovan calculations in Attachment C to this declaration, even though those calculations have not changed since my affirmative report.

14. I understand from counsel that many of Dr. Stangle's assertions rest on legal foundations and are contrary to the assumptions I have been asked to make by counsel. I do not address Dr. Stangle's criticisms that are based on an assumption of law that conflicts with the assumption of law that I have been provided by counsel. These include his arguments regarding generic bypass,<sup>17</sup> class members' interrelationships and any incentives to pursue joinder,<sup>18</sup> and his position that overcharges should only be assessed on products that Ranbaxy actually sold.<sup>19</sup> I have been informed by counsel that, as a matter of law, it is not proper to account for generic bypass. I have also been informed by counsel that, in class certification matters, courts treat separately purchasers that are separate corporate entities that are separately billed by the manufacturer. Furthermore, I have been informed that counsel intends to prove that Ranbaxy's alleged misconduct resulted in the delay of generic versions of Diovan, Nexium and Valcyte regardless of the generic seller, and that as such they are of the view that under the law it is necessary and proper to evaluate overcharges on direct sales made by all brand and generic manufacturers of these products. Of course, if the Court in this matter rules differently under the law in any of these respects, my model and approach can be adjusted to address that changed circumstance.

15. Dr. Stangle relies on other defendant experts to assert that the but-for scenarios I have been asked to assume are incorrect and he suggests that, by not accepting his alternative scenarios, my methodology somehow "does not isolate the economic effect of the conduct at issue."<sup>20</sup> It is my understanding that Plaintiffs' counsel intend to adduce substantial evidence from which the jury may find the but-for scenarios I have been asked to assume. Under this assumption, my overcharge calculations do indeed "isolate the economic effect of the conduct at issue" using common proof. I do not address defendants' but-for world assumptions because they are outside the scope of my assignment. Furthermore, my overcharges methodology can readily accommodate any alternative but-for world assumptions that are determined by the jury.

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<sup>17</sup> See Stangle Report, ¶¶ 58-62.

<sup>18</sup> Stangle Report, Appendix C, ¶¶ 34-44.

<sup>19</sup> See Stangle Report, ¶¶ 131-134.

<sup>20</sup> Stangle Report, ¶¶ 67-71.

**A. Dr. Stangle’s “Baseline Corrections” Are Either Incorrect or Have a De Minimis Effect on Overcharges**

**1. Dr. Stangle’s “Baseline Correction” #1, Using WAC Prices, Is Incorrect**

16. Dr. Stangle argues that one should use a list price known as wholesale acquisition cost (“WAC”) instead of the actual net prices faced by direct purchasers that I use when assessing overcharges due to the challenged conduct. He argues that generic manufacturers state that they set their prices by looking at brand manufacturer WAC prices before generic launch. He argues further that generic manufacturers are not aware of branded discounting since such discounts are proprietary and secret.<sup>21</sup>

17. The use of a list price when modeling direct purchaser overcharges in this matter is improper because it does not reflect the actual prices paid by the DPPs. The proper economic methodology is to evaluate prices net of all discounts and adjustments in order to determine the net effect of the challenged conduct. It is widely understood that brand name drug manufacturers discount below their list prices and a generic manufacturer that ignored those discounts when setting their own price would not maximize profits. In particular, generic prices would be too high relative to the profit-maximizing price.

18. Further, Dr. Stangle’s suggestion that generic manufacturers are blind to the brand manufacturer’s strategies and pricing is naïve and ignores the fact that generic manufacturers forecast and model brand prices.<sup>22</sup> As such, generic manufacturer discounting follows from the awareness of brand net prices. In my experience, generic manufacturers routinely obtain publicly available IQVIA National Sales Perspective (“NSP”) data which show a substantial part of the branded discounts relevant to a generic manufacturer’s direct customers. The generic manufacturer forecasts in this case indeed reveal the use of IQVIA data.<sup>23</sup>

19. Finally, while I disagree on principle that WAC is the appropriate pricing benchmark for my yardsticks, it is important to note that Dr. Stangle’s use of WAC makes very little difference to overcharges. Including his WAC adjustment and his inclusion of non-direct purchaser returns

<sup>21</sup> Stangle Report, ¶¶ 125-126 and footnote 182.

<sup>22</sup> See, for examples, SUN\_00544321, SUN\_02689563, SUN\_00544337, TORRENT049673, sheet “Valsartan,” and DRL-Valganciclovir-Supp-000001, sheets “Valganciclovir\_bestcase,” and “Valganciclovir-base.”

<sup>23</sup> See, for examples, the generic manufacturer forecasting documents which include IQVIA (previously known as IMS) data: SUN\_00544321, SUN\_02689563, SUN\_00544337, and Lupin-Meijer000605-655, at 605.

decreases overcharges only between 2.2% and 2.7% across Diovan Scenarios 1 and 2, Nexium Scenario 2, and Valcyte.

**2. Dr. Stangle's "Baseline Correction" #2, Excluding Valcyte Purchasers that Were Excluded in My Errata, Has a *De Minimis* Effect on Overcharges**

20. In my errata, I excluded from my list of customers<sup>24</sup> direct purchasers of branded Valcyte who, apparently, have not purchased the generic because brand-only purchasers have been explicitly excluded from the Class definition. Dr. Stangle states that these customers should also have been removed from my overcharges model.<sup>25</sup> While my original calculations make the reasonable assumption that brand-only customers' volume is encompassed in the but-for brand volume, one could take Dr. Stangle's approach and exclude these customers from the actual sales volume in my model. This alternative leads to a *de minimis* reduction in overcharges; following this approach, I have updated my overcharges calculation for Valcyte. Direct purchaser overcharges for Valcyte after having made this change are now \$125.8 million, a reduction of 0.3% from my previous calculation.<sup>26</sup>

**3. Dr. Stangle's "Baseline Correction" #3, Accounting for Returns by Non-Direct Purchasers, Is Incorrect and Has a *De Minimis* Effect on Overcharges**

21. Dr. Stangle asserts that it is "is logically incorrect to assign damages to returned units even if those returns did not flow through a direct purchaser but instead were returned directly to the manufacturer by an entity that originally purchased the product indirectly through a wholesaler or distributor."<sup>27</sup> My understanding from counsel is that transactions relating to non-class members should not be accounted for in my overcharges calculations.<sup>28</sup> Regardless, taking account of non-class member return quantities as Dr. Stangle suggests has a *de minimis* effect on overcharges with reductions of a mere fraction of a percent. Diovan Scenarios 1 and 2

<sup>24</sup> Errata for Declaration of Meredith Rosenthal in Support of Certification of the Class of Direct Purchasers of Diovan, Nexium and Valcyte, *In Re Ranbaxy Generic Drug Application Antitrust Litigation*, MDL No. 19-md-2878-NMG, January 13, 2021, Attachment F.4.

<sup>25</sup> Stangle Report, ¶ 127.

<sup>26</sup> See the revised Attachment E to this declaration.

<sup>27</sup> Stangle Report, ¶ 128.

<sup>28</sup> Note that I have already accounted for all returns related to class members who purchased directly from the manufacturers.

overcharges would be reduced by only 0.0002%; Nexium Scenario 1 overcharges would be reduced by only 0.00008%; Nexium Scenario 2 overcharges would be reduced by only 0.004%; and Valcyte would not change since there are no additional returns in the data to include.<sup>29</sup>

**4. Dr. Stangle's "Baseline Correction" #4, Using Different Nexium Sales Data, Disregards More Recent Data Productions and Therefore Are Incorrect**

22. Dr. Stangle asserts that "for Nexium, without justification, Dr. Rosenthal ignores AstraZeneca's data on actual 2015 brand prices and instead interpolates prices between December 2014 and January 2016. I replace Dr. Rosenthal's interpolated 2015 brand prices with actual monthly brand prices and apply Dr. Rosenthal's method to estimate but-for Nexium brand prices based on the actual monthly brand prices in 2015."<sup>30</sup> My decision to do this was not without justification, as Dr. Stangle states. As noted in my report, I determined that the Nexium sales data for 2015 were missing relevant discounts, adjustments and chargebacks.<sup>31</sup> As such, I used an alternative source and a linear interpolation to model Nexium net prices. AstraZeneca subsequently produced more complete data after my original report was filed. These new data show direct sales, discounts, adjustments and chargebacks for the entire relevant time period.<sup>32</sup> Dr. Stangle ignored these new data and in so doing has ignored important discounts and chargebacks by using the data I initially discarded. Dr. Stangle's fourth "baseline correction" is thus incorrect and inferior to using the new data.

23. I now use these new Nexium data to update my overcharges calculations. This means that the methods I used previously to estimate prices are no longer necessary since I now have the relevant raw data.<sup>33</sup> Nexium Scenario 1 overcharges are now \$1.097 billion (a reduction of 10.5%). As for Nexium Scenario 2, the additional Nexium sales data has revealed that there are

<sup>29</sup> See my work papers. The additional return quantities are incorporated in the calculation of generic market share yardsticks and in the quantities included in the calculation of overcharges.

<sup>30</sup> Stangle Report, ¶ 129.

<sup>31</sup> Rosenthal Report, footnote 141.

<sup>32</sup> The newly produced AstraZeneca data are AZNONPARTY\_002560, AZNONPARTY\_002565, AZNONPARTY\_002566, and AZNONPARTY\_002569.

<sup>33</sup> However, there is one adjustment that still needs to be made with the new data. The new chargeback data in 2015 are organized on a quarterly basis. This means that Q1 2015 includes both pre- and post-generic launch brand pricing. Since brand discounting increased substantially right after actual generic launch, the 1Q 2015 chargeback data are not suitable for inclusion in the calculation of a pre-generic launch brand price. As such, my model uses December 2014 as the pre-generic launch brand price.

positive brand-brand overcharges until December 2015. Thereafter, the but-for brand price is above the actual brand price. As such, to be conservative, all overcharges (brand-generic, generic-generic and brand-brand) are now set to end as of December 2015. Using the new data and this new end point, Nexium Scenario 2 overcharges are \$3.856 billion (a reduction of 7.7%). Furthermore, due to the new Nexium sales data and since the time frame has changed for Nexium Scenario 2, I have updated the class member lists in Attachments F.2 and F.3 for Nexium Scenarios 1 and 2 respectively. There are now 51 class members for Nexium Scenario 1 and 91 class members for Nexium Scenario 2.<sup>34</sup>

**B. Dr. Stangle's Overcharges End Dates Are Based on Incorrect Logic and Are Incorrect**

24. Dr. Stangle states that all brand-generic overcharges should end as of the time of actual generic entry because, according to him, direct purchasers were no longer “precluded from purchasing the generic” and he apparently believes that any lagging of generic purchases after that date reflects a preference for the brand.<sup>35</sup> Dr. Stangle is incorrect. The fact that direct purchasers do not shift immediately to generic purchasing does not reflect a preference for the brand. It reflects the normal process by which generic penetration occurs, influenced by the supply chain frictions and other factors. It is simply common sense that generic sales volume does not instantaneously reach the ultimate steady state market share of 90-95%. It takes time for warehouses to be stocked and for purchasing patterns to shift. My overcharges model takes account of this by using actual time patterns of generic substitution; ending brand-generic overcharges as of the time of actual generic entry is unwarranted and factually incorrect.

25. Dr. Stangle also incorrectly claims that Valcyte generic-generic overcharges should end as of the moment when there are 2 generic manufacturers in both the actual and but-for world. He claims that: “With the same number of generic competitors marketing generic versions of Valcyte in the actual and but-for worlds, there is no basis to assume that the delay in generic entry would result in different generic prices, and therefore no basis for continuing generic-

<sup>34</sup> Note that in my previous versions of Attachments F.2 and F.3, the customer DDNC was inadvertently included and is now excluded since it is a governmental entity.

<sup>35</sup> Stangle Report, ¶ 135.



generic damages.”<sup>36</sup> This assertion is false, reflects a lack of understanding of generic competition, and contradicts the economic evidence. While it may be reasonable to assume that the *percentage price discount* is the same where one has 2 generic manufacturers in both the actual and but-for worlds, this does not mean that the price *levels* ought to be the same. As I explained in my affirmative report, the pricing yardsticks are applied at points in time with different net prices. A lower starting net price in the but-for world would yield lower generic prices than in the actual world even if there eventually are the same number of generic manufacturers in both worlds.

26. Dr. Stangle makes the same argument for Nexium Scenario 2 generic-generic overcharges. He claims that as of September 2015, there would be comparable numbers of generic manufacturers in the actual and but-for worlds (four and five, respectively) and therefore actual and but-for generic prices would be equal.<sup>37</sup> He bases this assertion on a misunderstanding of published research.<sup>38</sup> Though it may be true that, as the research states, the marginal effect of additional generic manufacturers coming to market after the fourth or fifth is “negligible,” that does not mean actual and but-for prices would be the same. The negligible effect is with respect to a given, single price series and says nothing about a comparison across price series, such as a comparison between an actual price series and a but-for price series where generic launch occurred earlier and with respect to a relatively lower brand price. What Dr. Stangle seems not to understand is that though the actual pricing trends may be similar to the but-for pricing trends with comparable numbers of generic manufacturers, the price levels may not be. Again, a given generic price decline percentage applied against a relatively lower, earlier brand price will yield lower generic prices compared to what would occur if that same generic price decline percentage were applied to a later, higher brand price. And this assumes that the same number of generic entrants yields the same generic price decline percentages, which is not always true when observing the actual data. This fact can be seen in my overcharges analysis. In September 2015 for Nexium Scenario 2, where Dr. Stangle says overcharges should be terminated, the actual price decline yardstick is -35.2% and the but-for price decline yardstick is

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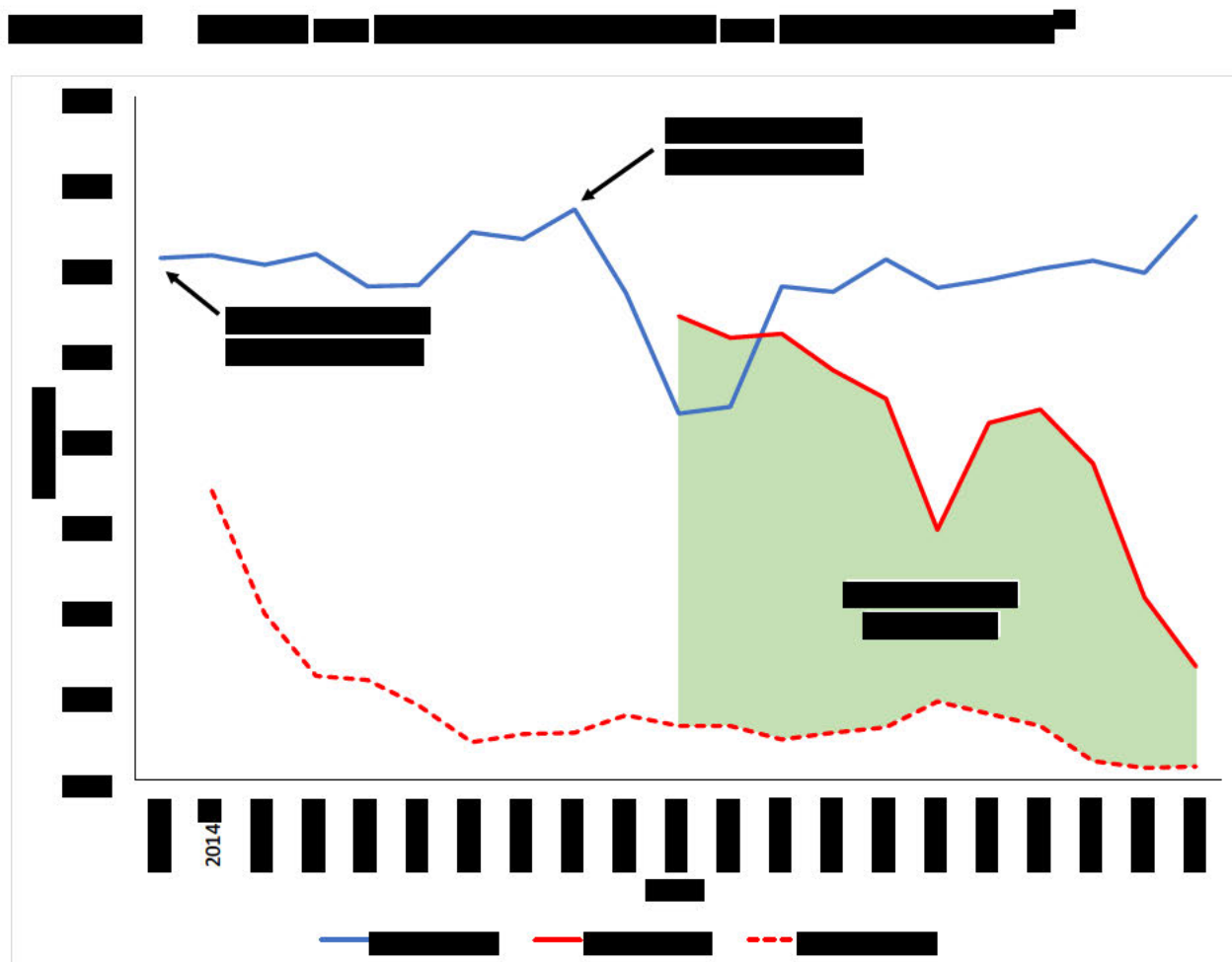
<sup>36</sup> Stangle Report, ¶ 136.

<sup>37</sup> Stangle Report, ¶ 137.

<sup>38</sup> E.R. Berndt, *et al.*, “Authorized Generic Drugs, Price Competition, and Consumers’ Welfare,” *Health Affairs*, 26(3), May 2007, pp. 790–799, at p. 792.



-89.5%, and the actual generic price is \$4.33 per pill and the but-for generic price is only \$0.64 per pill.<sup>39</sup> This is illustrated below in Figure 1, where it is clear that the actual and but-for generic prices diverge noticeably through December 2015.<sup>40</sup> The green shaded area depicts generic-generic overcharges due to this divergence. In this case, both the trend and the price levels are substantially different, yielding substantial generic-generic overcharges. Given the but-for world assumptions as given to me by counsel for Nexium Scenario 2, it would be incorrect to model generic-generic overcharges going to zero any earlier than December 2015, as I have done in my updated overcharges analysis.



<sup>39</sup> See Attachments D.4 and D.5.

<sup>40</sup> Note that December 2015 is the new end point for Nexium Scenario 2. See ¶ 23 above.

<sup>41</sup> Source: Attachment D.5. Note that this Attachment and this Figure use the new AstraZeneca Nexium sales data described in ¶ 22. See also footnote 30.

**C. Dr. Stangle Is Incorrect Where He Asserts that I Combine Brand Purchasers with Generic Purchasers**

27. Dr. Stangle observes that some class members only purchased the brand, some only purchased the generic, and those that purchased both tend to have varying generic substitution rates. He erroneously asserts that I apply my average yardstick uniformly to each and every distinct class member. He attempts to illustrate this issue by calculating overcharges separately for brand-only class members, generic-only class members, and he recalculates the yardstick for brand-generic class members by only focusing on those class members.<sup>42</sup>

28. Dr. Stangle's analysis is incorrect for two reasons. First, he misstates my opinions. It is not true that I have stated that my yardsticks ought to be applied equally to all individual class members. What I have done is applied my aggregate analysis and aggregate yardsticks to the entire class using common evidence. It is not my opinion that any particular brand-only class member would have purchased generics in the but-for world if there is no evidence of them having done so in the actual world. Overcharges for such customers are within the brand-brand overcharges in my calculations. The same is true for customers that only purchased the generic – they are included in the generic-generic overcharges in my calculations.

29. Second, to suggest that brand-generic overcharges should be evaluated using only data for customers that have purchased both the brand and generic is incorrect in an aggregate overcharges calculation and is, in fact, an attempt to bring in generic bypass. The reason why customers, like wholesalers, have a lower generic substitution rates is because some of the generic units are actually purchased by generic-only purchasers like retailers. As stated above, I have been informed by counsel that it is not the legal standard to disregard in the calculation of direct purchaser overcharges units actually purchased simply because of generic bypass. Dr. Stangle does just that with this so-called “correction” and therefore it should be disregarded.

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<sup>42</sup> Stangle Report, ¶¶ 139-143.

**D. Dr. Stangle Is Misleading when He Asserts that Overcharges Based on Brand Purchases Are Unjustified**

30. Dr. Stangle incorrectly asserts that overcharges on brand purchases are “unjustified” and he excludes brand-brand overcharges as well as brand-generic overcharges. His justifications appear to be the following: that “Plaintiffs’ expert Dr. McGuire claims that brand drugs are not part of the relevant markets in this case”; “academic research supports the claim that brand-brand damages are based on temporary brand discounts”; and Dr. Conti has not calculated brand-brand damages for Nexium.<sup>43</sup> As I explain below, all of Dr. Stangle’s assertions are incorrect. Note that this category accounts for the single largest “correction” Dr. Stangle proposes for my overcharges calculations.

31. Dr. Stangle misrepresents Dr. McGuire’s testimony. I understand that Dr. McGuire opines that the brand manufacturers did in fact have market power over the respective brands pre-generic entry, and that “evidence of Ranbaxy’s market power is rooted in evidence that Ranbaxy (a) excluded competitors, and (b) caused the Diovan, Nexium and Valcyte molecules to be sold at prices above levels that would have prevailed under competition.”<sup>44</sup> It is my understanding that counsel intend to prove that Ranbaxy’s conduct caused overcharges on brand purchases by the Class. Indeed, my overcharge models show that class members were overcharged on brand purchases due to the delay in generic entry, and this is consistent with the literature and real word experience.

32. As for the academic research, though it may be true that some brand discounts are temporary, proper methodology demands that we look at each drug separately. Rather than using a generalization from the academic research, I have allowed the data for each drug to tell me whether there were any brand discounts, and how persistent those discounts were. I found that there was indeed brand discounting for Diovan and Nexium, and I did not find brand discounting for Valcyte; I conducted my overcharges analysis accordingly. Even if Dr. Stangle is correct and brand discounts for Diovan and Nexium were “temporary,” those discounts would still have

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<sup>43</sup> Stangle Report, ¶¶ 121-122 and 144.

<sup>44</sup> Expert Report of Professor Thomas G. McGuire, *In Re Ranbaxy Generic Drug Application Antitrust Litigation*, MDL No. 19-md-2878-NMG, November 2, 2020, ¶¶ 150 and 172-176.

come into play in the but-for world and brand purchasers would have suffered overcharges during the “temporary” period of time.

33. Finally, Dr. Stangle appears to be confused regarding Dr. Conti’s damages. I understand that Dr. Conti, when calculating *end-payor* damages, did not evaluate brand-brand damages for the drugs at issue because the prices relevant for end-payors, *i.e.* prices *at retail*, do not reveal lower prices following generic entry. These are not the same prices paid by direct purchasers, and therefore Dr. Stangle’s statement that my overcharges calculations are “inconsistent” is simply false. Just as it is inappropriate to consider end-payor rebates for a direct purchaser analysis (as I discuss in the paragraph below), it is also inappropriate to consider end-payor prices. Direct purchasers face neither and, therefore, their consideration in an overcharges calculation is economically incorrect. Direct purchaser prices are typically based on WAC as a starting point, and involve additional discounts negotiated between the manufacturer and the direct purchasers. End payor prices are typically evaluated based on a discount off of AWP or an increase over WAC and are negotiated between the TPP or PBM and the retailer. Since direct purchasers and end payors face different prices at different levels of the supply chain, with different types of rebates and discounts, considering them to be the same as Dr. Stangle does is comparing apples and oranges and is inappropriate as a matter of economics.

#### **E. It Is Incorrect to Consider End-Payor Rebates in a Direct Purchaser Overcharges Calculation**

34. Dr. Stangle notes that I have assessed overcharges to direct purchasers based on the “payment flows [I believe] are associated with direct purchasers of the products at issue” but claims that I made a “fundamental error” by not including rebates paid by Novartis and AstraZeneca to “PBMs, third party payors and government entities.”<sup>45</sup> He then appears to state that it is necessary to “assess pass-on” and to consider “deterrence.” I understand from counsel that these are legal issues and I do not comment on them here. As part of this argument, however, Dr. Stangle states that I “ignored” the rebates paid to end-payors and governmental entities and seems to imply that these rebates should be considered in the calculation of direct purchaser overcharges.<sup>46</sup> As a matter of economics, it is incorrect to consider rebates paid to

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<sup>45</sup> Stangle Report, ¶¶ 75, 80.

<sup>46</sup> Stangle Report, ¶¶ 38, 75-81.

end-payors when calculating overcharges faced by direct purchasers. Direct purchasers never receive any of the rebate dollars paid to “PBMs, third party payors and government entities” that Dr. Stangle references. As such, it is entirely in error to consider such rebates in a calculation of direct purchaser overcharges. I did not “ignore” these rebates. I appropriately considered them and deemed them inappropriate for an analysis of direct purchaser overcharges.

#### **F. Other Errors in Dr. Stangle’s Overcharges Arguments**

35. Dr. Stangle mentions a handful of additional technical “corrections” that are incorrect. For instance, Dr. Stangle notes that I take a rolling average of three months when I calculate generic Diovan prices in the actual world. He asserts that instead I should have used the entire seven months from June 2014 to December 2014, and he adjusts overcharges accordingly. He claims that this “accounts for the timing mismatches between sales and subsequent credits.”<sup>47</sup> However, by taking a longer time window for the moving average, Dr. Stangle has included the early, lower discounting with the later, higher discounting in generic prices. In my opinion, it is better to track a narrower window so that generic prices match with the current level of discounting as generic competition evolves. In my opinion, a three-month window is more appropriate because of the rapid changes in the competitive landscape. It is more important to track the level of generic discounting rather than address the potential “mismatch between sales and subsequent credits.” Therefore, I believe Dr. Stangle’s adjustment in this instance is overbroad and I do not adjust my overcharges calculations as he suggests.

36. Dr. Stangle incorrectly states that “[i]n certain months of her damages period, Dr. Rosenthal inappropriately calculates damages on more units than were actually purchased by members of the proposed Nexium and Valcyte classes, causing her to overstate damages.”<sup>48</sup> For Nexium Scenario 1, using the updated data recently produced by AstraZeneca, this is not true. In months where there are more generic units in the but-for world than in the actual world (February and March 2015), I evaluate no brand-generic overcharges because the model suggests that there is no foreclosure of generic units in those months. Instead, I only evaluate overcharges on actual generic units purchased, since those units would have been available at a lower price in

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<sup>47</sup> Stangle Report, ¶ 146. Note that this adjustment to overcharges made by Dr. Stangle accounts for a decrease in overcharges of only 10.7%.

<sup>48</sup> Stangle Report, ¶¶ 151-153.

the but-for world. Thus, I do not calculate overcharges on more units than were actual sold; I only evaluate overcharges on the actual generic units sold. It would be improper to evaluate negative brand-generic overcharges merely because fewer generic units were purchased in the but-for world than the actual world. Furthermore, I understand from counsel that as a legal matter defendants are not entitled to such an offset to overcharges due to the challenged conduct. For Nexium Scenario 2, all of the preceding arguments are still true, but Dr. Stangle is correct that there is one additional correction that needs to be made for brand-brand overcharges. In a single month (February 2015), where the but-for brand units exceed the actual brand units, I have ensured that the model evaluates overcharges only on the actual units purchased.<sup>49</sup> Note that this category of Dr. Stangle's is not a concern for Valcyte at all, since there are no brand-brand overcharges for Valcyte and otherwise I only calculate overcharges on actual generic units sold in months where brand-generic overcharges are set to zero. Also note that this issue does not arise at all for the Diovan Scenarios. Overall, Dr. Stangle's concerns here are either no longer relevant due to the use of the recently produced Nexium data, or are incorrect in terms of the assertion of evaluating negative brand-generic overcharges.

37. Dr. Stangle argues that I should have allowed for negative generic-generic overcharges for Valcyte in months where the generic but-for price was greater than the actual generic price.<sup>50</sup> I understand from counsel that the defendants are not entitled to overcharges offsets in this way. Regardless, this adjustment for negative generic-generic overcharges accounts for a decrease in total overcharges of only 5.1%.

## V. CONCLUSIONS

38. I have shown that class-wide overcharges can be calculated using common proof and do not require individualized inquiry. I find that Dr. Stangle's incorrect arguments and invalid analyses do not controvert the methodology put forward in my affirmative report where I used common proof to show that the but-for prices were substantially below the actual prices paid by

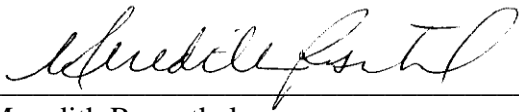
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<sup>49</sup> In my affirmative report, this adjustment was inadvertently not made in the Nexium Scenarios. With the updated data, it is only relevant for a single month in Nexium Scenario 2, which is February 2015. All other months with zero brand-brand damages in the Nexium Scenarios are due to instances where the but-for brand price is higher than the actual brand price. Again, I have been informed by counsel that there is a legal argument that defendants are not entitled to overcharges offsets in this way.

<sup>50</sup> Stangle Report, ¶¶ 154-155.

the Class, leading to significant aggregate overcharges. Due to the dramatic differences in the actual and but-for prices faced by the class members, all or nearly all were injured by the alleged conduct. Though Dr. Stangle points to pricing variation, which occurs in all markets, his flawed analysis fails to show that this variation means that individual class members did not sustain overcharges due to the challenged conduct.

39. I find that overcharges remain substantial: \$3.161 billion to \$3.279 billion for Diovan and valsartan, \$1.097 billion to \$3.856 billion for Nexium and esomeprazole magnesium, and \$125.8 million for Valcyte and valganciclovir.<sup>51</sup>



Meredith Rosenthal

March 22, 2021

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<sup>51</sup> The new overcharge totals take into account the new Nexium sales data and the exclusion of brand-only Valcyte customers, as described above.

**Attachment A**



## CURRICULUM VITAE

Date: February, 2021

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**BIRTHPLACE:** Boston, Massachusetts

### EDUCATION:

1998 Health Policy (Economics track), Ph.D., Harvard University  
1990 International Relations (Commerce), A.B., Brown University

### ACADEMIC APPOINTMENTS:

2011-present C. Boyden Gray Professor of Health Economics and Policy  
Department of Health Policy and Management  
Harvard School of Public Health  
2006-2011 Associate Professor of Health Economics and Policy  
Department of Health Policy and Management  
Harvard School of Public Health  
1998-2006 Assistant Professor of Health Economics and Policy  
Department of Health Policy and Management  
Harvard School of Public Health

### ADMINISTRATIVE APPOINTMENTS:

2017-2018 Senior Associate Dean for Academic Affairs  
Harvard T. H. Chan School of Public Health  
2013-2017 Associate Dean for Diversity  
Harvard T. H. Chan School of Public Health

### PROFESSIONAL SOCIETIES:

2014-present Elected Member, National Academy of Medicine (Institute of Medicine)  
2004-present American Society of Health Economists  
2000-present International Health Economics Association  
1995-present AcademyHealth  
*Planning Committee for 2008 Annual Research Meeting*

### OTHER PROFESSIONAL EXPERIENCE:

1996-present Academic Affiliate, Greylock McKinnon Associates  
1993-1994 Analyst, Health Economics Research, Inc./The Center for Health Economics Research  
1990-1993 Consultant, Price Waterhouse, Tax Economics Department

**SERVICE:**

2016-present	Member, Massachusetts Center for Health Information and Analysis Oversight Council
2013-2017	Board Chair, Massachusetts Health Quality Partners
2007-2016	Member, Massachusetts Public Health Council
2005	Expert Testimony, House Committee on Education and Workforce, House Subcommittee on Employer-Employee Relations, Hearing on Examining Pay-for-Performance Measures and Other Trends in Employer-Sponsored Health Care
2003	Expert Testimony, Senate Special Committee on Aging, Hearing on Direct to Consumer Advertising of Prescription Drugs: Exploring the Consequences
2001	Chair, Massachusetts Special Commission on Physician Compensation

**HONORS AND DISTINCTIONS:**

2016	AcademyHealth Paper of the Year Award
2016	Harvard TH Chan School of Public Health Student Mentoring Award
2015	Harvard TH Chan School of Public Health Advancement of Women Faculty Mentoring Award
2014	Harvard School of Public Health Junior Faculty Mentoring Award
2011	Harvard School of Public Health Teaching Citation
2010	Academy of Management Best Theory to Practice Paper in Health Care Management
2006	Alfred P. Sloan Foundation Industry Studies Fellowship
2003	Labelle Lectureship in Health Policy, McMaster University

**MAJOR ADMINISTRATIVE RESPONSIBILITIES:**

2016-2018	University President's Task Force on Inclusion and Belonging
2012-2014	Harvard School of Public Health Faculty Council, Vice-Chair (2012)
2007-2014	Harvard School of Public Health Committee on Admissions and Degrees, Chair (2010)
2007	Co-Chair, Harvard School of Public Health Child Care Task Force
2006-2011	Harvard School of Public Health Committee on the Concerns of Women Faculty
2000-present	Executive Committee on Higher Degrees in Health Policy, Harvard University
1999-present	Admissions Committee, Ph.D. Program in Health Policy, Harvard University

# **EDITORIAL ACTIVITIES:**

1997-present	Referee: <i>Journal of Health Economics, Inquiry, Health Services Research, Health Affairs, Journal of the American Medical Association, New England Journal of Medicine, and others</i>
2012-2015	Member, <i>New England Journal of Medicine</i> , Perspective Advisory Board
2008-2014	Associate Editor, Medical Care, Research and Review
1997-1998	Assistant Editor, Evidence-based Health Policy and Management

# **MAJOR RESEARCH INTERESTS:**

1. Market-oriented health policy
2. Physician payment incentives
3. Consumerism and consumer-directed health plans
4. Economics of the pharmaceutical industry

# **RESEARCH SUPPORT:**

## Past Funding:

2016-2018	Generic Drug Pricing: Actionable Research for Policy, Commonwealth Fund, Principal Investigator
2015-2017	Improving the Value of Health Care Choices, Arnold Foundation, <i>Principal Investigator</i>
2012-2017	Optimizing Ambulatory Patient Safety in Partnership with Primary Care Transformation, HMS Gift/CRICO, <i>Co-Principal Investigator</i>
2016-2017	Physician Payment in ACOs, Arnold Foundation, <i>Principal Investigator</i>
2013-2015	Understanding the Use and Impact of Price Data in Health Care, RWJF, <i>Co- Investigator</i>
2013-2015	Impact of Price Transparency Tools on Consumer Behavior, RWJF, <i>Co- Investigator</i>
2013-2015	Getting the Complete Picture: What Does the Body of Research on the Patient-Centered Medical Home Really Tell Us? CMWF, <i>Principal Investigator</i>
2013-2015	Prevalence and Variation in Over-Use of Health Services in Commercially Insured Patients, Peter G. Peterson Foundation, <i>Principal Investigator</i>
2013-2015	Measuring Overuse of Health Care: Are Providers and Patients ‘Choosing Wisely’?, CMWF, <i>Co-investigator</i>
2013-2014	Prevalence and Variation in Over-Use of Health Services in Medicare: Choosing Wisely, RWJF, <i>Co-investigator</i>
2012-2015	Evaluating Sequential Strategies to Reduce Readmission in Diverse Populations, AHRQ, <i>Co-investigator</i>
2010-2014	Factors Associated with Effective Implementation of a Surgical Safety Checklist, AHRQ (R18), <i>Co-investigator</i>

2010-2014	A Randomized Trial of Behavioral Economic Interventions to Reduce CVD Risk, NIA (RC4), <i>Co-investigator</i>
2008-2010	Rewarding Quality Diabetes Management, RWJF/Hudson Health Plan, <i>Principal Investigator</i>
2008-2009	Effects of High-Deductible Health Plans on Families with Chronic Conditions, RWJF/Harvard Pilgrim Healthcare Plan, <i>Co-Investigator</i>
2008-2008	Implications of Value-Based Purchasing for Health Disparities: A Synthesis of the Evidence, Office of Minority Health, Department of Health & Human Services, <i>Principal Investigator</i>
2008-2008	Payment Reform Opportunities for Medicaid Programs, University of Pittsburgh, <i>Principal Investigator</i>
2007-2009	Changes in Health Care Financing and Organization: How does Fragmentation of Care Contribute to the Costs of Care? RWJF/HCFO, <i>Co-investigator</i>
2006-2008	Evaluating the Impact of a Novel Pay for Performance Program in a Medicaid Managed Care Plan, The Commonwealth Fund, <i>Principal Investigator</i>
2006-2008	Sloan Industry Studies Fellowship for Meredith Rosenthal, Alfred P. Sloan Foundation, <i>Principal Investigator</i>
2005-2008	Incentive Formularies and the Costs and Quality of Care, Agency for Healthcare Research and Quality, <i>Co-investigator</i>
2005-2007	Strategies to Improve the Value of Health Benefit Spending for Low-Wage Workers, The Commonwealth Fund, <i>Principal Investigator</i>
2005-2007	Uptake and Impact of Health Risk Appraisals, RWJ Health Care Financing and Organization Initiative, <i>Principal Investigator</i>
2003-2007	The Patterns and Impact of Value Based Purchasing, Agency for Healthcare Research and Quality, <i>Co-investigator</i>
2002-2007	Coverage, Organization of Care, and Colorectal Screening, National Institutes of Health, <i>Co-investigator</i>

## Current Funding

- |           |   |
|-----------|---|
| 2015-2020 | Accelerating the Use of Evidence-based Innovations in Healthcare Systems, AHRQ, <i>Principal Investigator</i>           |
| 2016-2021 | Identifying Cascades of Low-Value Care and the Organizational Practices that Prevent Them, AHRQ, <i>Co-Investigator</i> |
| 2019-2021 | Price, Spending and Utilization Impacts of Vertical Integration in Massachusetts, Laura and John Arnold Foundation      |

## TEACHING EXPERIENCE

- |              |  |
|--------------|--|
| 2016-present | Health Policy and Management 260: Health Economics with Applications to Global Health Policy   |
| 2003-present | Health Policy and Management 209: Economics for Health Policy                                  |
| 2013-2014    | Global Health and Health Policy 50 (Harvard College): The Quality of Care in the United States |
| 1999-2001    | Health Policy and Management 507: Mental Health Economics and Policy in the United States      |

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**Meredith Rosenthal**  
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*In re Opana ER Antitrust Litigation*, United States District Court for the Northern District of Illinois, Eastern Division, MDL No. 2580

*In re Ranbaxy Generic Drug Application Antitrust Litigation*, United States District Court for the District of Massachusetts, MDL No. 19-md-2878-NMG

*In re Solodyn (Minocycline Hydrochloride) Antitrust Litigation*, United States District Court for the District of Massachusetts, MDL No. 2503 1:14-MD-2503-DJC

*In re Testosterone Replacement Therapy Products Liability Litigation*, United States District Court, Northern District of Illinois, Eastern Division, MDL No. 2545, Case No. 1:14-cv-8857

*In re Zetia (ezetimibe) Antitrust Litigation*, United States District Court for the Eastern District of Virginia, Case No. 18-md-2836

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*United States of America ex rel. Kevin N. Colquitt vs. Abbott Laboratories*, United States District Court for the Northern District of Texas, Dallas Division, Civil Action No. 3:06-cv-01769-M

*United States of America ex rel. Yoash Gohil v. Sanofi-Aventis U.S. Inc., et al.*, United States District Court for the Eastern District of Pennsylvania, No. 2-c-2964

*United States of America, ex rel. Wendy A. Bahnsen et al., v. Boston Scientific Neuromodulation Corporation*, United States District Court for the District of New Jersey, Docket No. 11-cv-1210-(JMV) (SCM)

*State of New Hampshire v. Johnson & Johnson; Janssen Pharmaceuticals, Inc.; Ortho-McNeil-Janssen Pharmaceuticals Inc., et al.*, Merrimack Superior Court, Docket No. 217-2018-CV-00678

**Attachment B**

## **Attachment B: Additional Materials Relied Upon**

### **Bates Documents**

DRL-Valganciclovir-Supp-000001

Lupin-Meijer000605-655

SUN\_00544321

SUN\_00544337

SUN\_02689563

TORRENT049673

### **Expert Reports**

Declaration of Meredith Rosenthal in Support of the Certification of the Class of Direct Purchasers of Diovan, Nexium, and Valcyte, *In Re Ranbaxy Generic Drug Application Antitrust Litigation*, MDL No. 19-md-2878-NMG, November 2, 2020.

Errata for Declaration of Meredith Rosenthal in Support of Certification of the Class of Direct Purchasers of Diovan, Nexium and Valcyte, *In Re Ranbaxy Generic Drug Application Antitrust Litigation*, MDL No. 19-md-2878-NMG, January 13, 2021.

Expert Report of Bruce E. Stangle, Ph.D., *In Re Ranbaxy Generic Drug Application Antitrust Litigation*, MDL No. 19-md-2878-NMG, February 10, 2021.

Expert Report of Professor Thomas G. McGuire, *In Re Ranbaxy Generic Drug Application Antitrust Litigation*, MDL No. 19-md-2878-NMG, November 2, 2020.

### **Other Documents**

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Frank, R.G. and R.S. Hartman, “The Nature of Pharmaceutical Competition: Implications for Antitrust Analysis,” *International Journal of the Economics of Business*, 22(2), 2015, pp. 301–343.

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### **Electronic Data**

AstraZeneca Nexium Sales Data:

AZNONPARTY\_002560

AZNONPARTY\_002565

AZNONPARTY\_002566

AZNONPARTY\_002569

**Attachment C**

### Attachment C.1: Diovan and Valsartan Manufacturer Sales Data

	1	2	3	4	5	6	7
	Diovan			Valsartan			
Month	Sales	Pills	Average Price per Pill	Sales	Pills	Average Price per Pill	3-Month Moving Average Price per Pill
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]				
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]				
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]				
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]				
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]				
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]				
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]				
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]				
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]				
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]				
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]				
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]				
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]				
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]				
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]				
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]				
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]				
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]				
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]				
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]				
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]				
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]				
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	\$2,377,088	786,240	\$3.02	\$3.02
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	\$355,479,149	105,448,560	\$3.37	\$3.37
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	\$34,207,458	17,945,070	\$1.91	\$3.16
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	\$24,945,992	14,679,330	\$1.70	\$3.00
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	\$33,318,112	19,655,670	\$1.70	\$1.77
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	\$51,008,360	21,659,130	\$2.36	\$1.95
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	\$31,966,854	19,473,999	\$1.64	\$1.91
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	\$7,564,116	52,805,470	\$0.14	\$0.96
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	\$195,501	29,873,405	\$0.01	\$0.39
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	\$2,376,265	37,441,810	\$0.06	\$0.08
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	-\$8,797,741	31,396,010	-\$0.28	\$0.08
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	-\$2,611,458	37,408,756	-\$0.07	\$0.08
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	\$9,045,562	39,601,009	\$0.23	\$0.08

**Attachment C.1: Diovan and Valsartan Manufacturer Sales Data**

	1	2	3	4	5	6	7
	Diovan			Valsartan			
Month	Sales	Pills	Average Price per Pill	Sales	Pills	Average Price per Pill	3-Month Moving Average Price per Pill
				\$2,446,735	35,571,350	\$0.07	\$0.08
				\$281,739	40,606,689	\$0.01	\$0.10
				\$4,247,551	36,218,311	\$0.12	\$0.06
				\$4,130,873	38,315,635	\$0.11	\$0.08
				\$1,706,991	43,417,251	\$0.04	\$0.09
				\$11,086,214	51,575,914	\$0.21	\$0.13
				\$9,394,022	46,329,710	\$0.20	\$0.16
				\$4,415,053	39,558,651	\$0.11	\$0.18
				\$4,672,464	48,379,239	\$0.10	\$0.14
				\$4,337,739	42,277,921	\$0.10	\$0.10
				-\$2,714,005	41,193,350	-\$0.07	\$0.05
				\$3,187,534	42,869,849	\$0.07	\$0.04
				\$5,792,368	45,519,483	\$0.13	\$0.05
				-\$43,537	47,350,528	\$0.00	\$0.07
				\$3,143,381	45,564,629	\$0.07	\$0.06
				\$3,928,868	44,923,946	\$0.09	\$0.05
				\$1,887,431	49,651,616	\$0.04	\$0.06
				\$5,461,013	48,903,684	\$0.11	\$0.08
				\$3,872,969	49,308,268	\$0.08	\$0.08
				\$2,011,705	42,277,367	\$0.05	\$0.08
				\$5,540,571	52,492,373	\$0.11	\$0.08
				\$2,973,322	36,480,232	\$0.08	\$0.08
				\$1,054,210	39,444,282	\$0.03	\$0.07
2017-06				\$5,416,132	42,344,070	\$0.13	\$0.08
2017-07				\$3,887,454	37,917,462	\$0.10	\$0.09
2017-08				\$3,807,244	49,862,092	\$0.08	\$0.10
2017-09				\$3,974,779	41,827,908	\$0.10	\$0.09
2017-10				\$4,934,204	46,646,998	\$0.11	\$0.09
2017-11				\$2,080,056	44,349,771	\$0.05	\$0.08
2017-12				\$5,207,322	43,253,024	\$0.12	\$0.09
2018-01				\$3,294,502	44,869,496	\$0.07	\$0.08
2018-02				\$2,119,864	44,868,130	\$0.05	\$0.08
2018-03				\$2,250,604	48,132,190	\$0.05	\$0.06
2018-04				\$959,427	46,509,087	\$0.02	\$0.04
2018-05				\$2,032,802	55,942,116	\$0.04	\$0.03



**Attachment C.1: Diovan and Valsartan Manufacturer Sales Data**

	1	2	3	4	5	6	7
	Diovan			Valsartan			
Month	Sales	Pills	Average Price per Pill	Sales	Pills	Average Price per Pill	3-Month Moving Average Price per Pill
2018-06				-\$1,321,208	32,585,973	-\$0.04	\$0.01
2018-07				\$1,261,858	19,400,102	\$0.07	\$0.02
2018-08				\$2,634,510	20,125,988	\$0.13	\$0.04
2018-09				\$18,842,695	50,732,605	\$0.37	\$0.25
2018-10				\$7,178,474	28,378,264	\$0.25	\$0.29
2018-11				\$33,278	12,021,762	\$0.00	\$0.29
2018-12				\$1,961,470	11,599,009	\$0.17	\$0.18
2019-01				\$2,071,547	10,907,851	\$0.19	\$0.12
2019-02				-\$1,198,080	6,806,657	-\$0.18	\$0.10
2019-03				\$1,704,786	12,683,818	\$0.13	\$0.08
2019-04				-\$416,742	7,150,985	-\$0.06	\$0.00
2019-05				-\$718,944	9,430,879	-\$0.08	\$0.02
2019-06				\$1,083,412	5,805,049	\$0.19	\$0.00
2019-07				\$937,317	5,619,570	\$0.17	\$0.06
2019-08				\$724,017	5,591,393	\$0.13	\$0.16
2019-09				\$575,900	3,350,594	\$0.17	\$0.15
2019-10				\$888,786	3,997,405	\$0.22	\$0.17
2019-11				\$498,488	2,130,614	\$0.23	\$0.21
2019-12				\$5,742,587	20,197,001	\$0.28	\$0.27
2020-01				\$1,837,156	6,187,050	\$0.30	\$0.28

**Notes:**

- 1-2 Source: Novartis transactional sales, credits, chargebacks and returns data (NPC-Diovan-000503.xlsx, NPC-Diovan-000504.xlsx, NPC-Diovan-000505.xlsx, NPC-Diovan-000506.xlsx, NPC-Diovan-000507.xlsx, NPC-Diovan-000508.xlsx, NPC-Diovan-000509.xlsx, NPC-Diovan-000510.xlsx, NPC-Diovan-000582.xlsx, NPC-Diovan-000588.xlsx, NPC-Diovan-000589.xlsx, NPC-Diovan-000590.xlsx, NPC-Diovan-000591.xlsx, NPC-Diovan-000592.xlsx, NPC-Diovan-000593.xlsx, NPC-Diovan-000594.xlsx, NPC-Diovan-000595.xlsx).
- 3 = Column 1 / Column 2.
- 4-5 Source: Generic manufacturer transactional sales data:

**Attachment C.1: Diovan and Valsartan Manufacturer Sales Data**

	1	2	3	4	5	6	7
	Diovan			Valsartan			
			Average Price per Pill			Average Price per Pill	3-Month Moving Average Price per Pill
Month	Sales	Pills	Pill	Sales	Pills	Pill	Pill

Ranbaxy (SUN\_02773728+Valsartan+2014+to+2017.XLSX, SUN\_02767657\_Valsartan 2014\_chargeback.xls, SUN\_02767658\_Valsartan 2015\_chargeback.xls, SUN\_02767659\_Valsartan 2016\_chargeback.xls, SUN\_02753984\_Valsartan 2017\_chargeback.xls); Sandoz (Sandoz-Valsartan-000002, Sandoz-Valsartan-000003, Sandoz-Valsartan-000004, Sandoz-Valsartan-000005); Aurobindo (Valsartan Tablets Chargeback Data 2014-2019.xlsx, Valsartan data from Jan 2015-Mar 2019 - SALES - Final.xlsx, Valsartan tabs Rebate Data 2014-2019 - FINAL.xlsm, Valsartan Tabs Special Instructions Sales Return Data with Qty 2014-2019 - FINAL.xlsm); Jubilant (Copy of Valsartan Chargeback data since launch - separate worksheets per NDC#.xlsm, Copy of Valsartan Sales since launch.xlsx); Mylan (MYLVAL00016133- HIGHLY CONFIDENTIAL.xlsx, MYLVAL00016134 - HIGHLY CONFIDENTIAL.xlsx); Hetero/Camber (HETERO00000059-HETERO00000059\_Attorneys\_Eyes\_Only.xlsx, HETERO00000060-HETERO00000060\_Attorneys\_Eyes\_Only.xlsx); Princeton (PRIN-00000001.xlsx, PRIN-00000003.xlsx, PRIN-00000004.xlsx, PRIN-00000005.xlsx, PRIN-00000006.xlsx); Teva (TEVA\_RANBAXY-ANTITRUST.0000016); Lupin (VALSARTAN Chargeback data - Highly Confidential - Outside Counsel Eyes Only.csv, Valsartan Gross to Net Sales- Highly Confidential - Outside Counsel Eyes Only.xls); Endo (ENDO\_000567, ENDO\_000568, ENDO\_000569, ENDO\_000570); Amneal (AMNEAL05922-AMNEAL05922.xlsx); Alembic (ALEMBIC000078.xlsx); Torrent (TORRENT048303).

6 = Column 4 / Column 5.

7 = Prior three month sum from Column 4 / prior three month sum for Column 5.

Since the data show negative prices, from April 2015 to June 2015, prices are calculated as the average of the prices found in March 2015 and July 2015.

## Attachment C.2: Diovan and Valsartan Yardstick Calculation - Scenario 1

	1	2	3	4	5	6	7	8	9	10	11	12
	Diovan		Valsartan		Yardstick Inputs				But-For Yardsticks			
Month	Average Price per Pills	Pill	3-Month Moving Average Pills	Price per Pill	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	Brand Price Change	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	Brand Price Change
									2	2%	-30.9%	-1.3%
									2	86%	-23.0%	-14.9%
									3	59%	-27.8%	-18.7%
									3	51%	-31.3%	-16.6%
									4	53%	-59.5%	-10.6%
									5	58%	-55.4%	-12.0%
									5	54%	-56.2%	-13.4%
									7	84%	-57.2%	-13.3%
									7	80%	-58.2%	-13.2%
									7	82%	-59.2%	-13.0%
									7	81%	-60.2%	-12.9%
									7	85%	-61.2%	-12.8%
									7	86%	-62.2%	-12.7%
									7	87%	-63.2%	-12.6%
									7	87%	-64.1%	-12.5%
									7	87%	-65.1%	-12.4%
									7	92%	-66.1%	-12.3%
									7	89%	-67.1%	-12.2%
									7	92%	-68.1%	-12.1%
									7	93%	-69.1%	-12.0%
									7	96%	-70.1%	-11.9%
			786,240	\$3.02	1	2%	-30.9%	-1.3%	8	94%	-71.1%	-11.8%
			105,448,560	\$3.37	2	86%	-23.0%	-14.9%	8	95%	-72.0%	-11.7%
			17,945,070	\$3.16	2	59%	-27.8%	-18.7%	8	94%	-73.0%	-11.6%
			14,679,330	\$3.00	2	51%	-31.3%	-16.6%	8	94%	-74.0%	-11.4%
			19,655,670	\$1.77	2	53%	-59.5%	-10.6%	8	95%	-75.0%	-11.3%
			21,659,130	\$1.95	2	58%	-55.4%	-12.0%	8	95%	-76.0%	-11.2%
			19,473,999	\$1.91	2	54%	-56.2%	-13.4%	8	96%	-77.0%	-11.1%
			52,805,470	\$0.96	10+	84%	-78.0%	-11.0%	10+	97%	-78.0%	-11.0%
			29,873,405	\$0.39	10+	80%	-91.1%	-25.3%				
			37,441,810	\$0.08	10+	82%	-98.1%	-19.0%				
			31,396,010	\$0.08	10+	81%	-98.1%	-30.0%				
			37,408,756	\$0.08	10+	85%	-98.1%	-30.1%				

**Attachment C.2: Diovan and Valsartan Yardstick Calculation - Scenario 1**

	1	2	3	4	5	6	7	8	9	10	11	12
	Diovan		Valsartan		Yardstick Inputs				But-For Yardsticks			
Month	Average Price per Pills	Pill	3-Month Moving Average Pills	Price per Pill	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	Brand Price Change	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	Brand Price Change
			39,601,009	\$0.08	10+	86%	-98.1%	-25.2%				
			35,571,350	\$0.08	10+	87%	-98.2%	-45.0%				
			40,606,689	\$0.10	10+	87%	-97.7%	-22.9%				
			36,218,311	\$0.06	10+	87%	-98.6%	-26.9%				
			38,315,635	\$0.08	10+	92%	-98.3%	-37.6%				
			43,417,251	\$0.09	10+	89%	-98.0%	-16.0%				
			51,575,914	\$0.13	10+	92%	-97.1%	-30.5%				
			46,329,710	\$0.16	10+	93%	-96.4%	-50.0%				
			39,558,651	\$0.18	10+	96%	-95.9%	-79.9%				
			48,379,239	\$0.14	10+	94%	-96.9%	-10.8%				
			42,277,921	\$0.10	10+	95%	-97.6%	-34.4%				
			41,193,350	\$0.05	10+	94%	-98.9%	-12.8%				
			42,869,849	\$0.04	10+	94%	-99.1%	-25.5%				
			45,519,483	\$0.05	10+	95%	-98.9%	-19.0%				
			47,350,528	\$0.07	10+	95%	-98.5%	3.8%				
			45,564,629	\$0.06	10+	96%	-98.5%	-11.3%				
			44,923,946	\$0.05	10+	97%	-98.8%	20.7%				
			49,651,616	\$0.06	10+	97%	-98.5%	17.1%				
			48,903,684	\$0.08	10+	98%	-98.2%	23.2%				

**Notes:**

- 1 = C.1 Column 2.
- 2 = C.1 Column 3.
- 3 = C.1 Column 5.
- 4 = C.1 Column 7.
- 5 Count of generic manufacturers that launched in the actual world, based on the produced manufacturer sales data.
- 6 = Column 3 / (Column 1 + Column 3).
- 7 = (Column 4 - Column 2 in May 2014) / (Column 2 in May 2014).
- 8 = (Column 2 - Column 2 in May 2014) / (Column 2 in May 2014).
- 9 Count of generic manufacturers that would have launched in the but-for world according to the but-for Scenario.
- 10 = Column 6, beginning in September 2012.
- 11 = From September 2012 through March 2013, set equal to Column 7. From April 2013 to December 2014, based on a linear interpolation between Column 7 in December 2014 and January 2015.

**Attachment C.2: Diovan and Valsartan Yardstick Calculation - Scenario 1**

	1	2	3	4	5	6	7	8	9	10	11	12
	Diovan		Valsartan		Yardstick Inputs				But-For Yardsticks			
Month	Average Price per Pills	Pill	3-Month Moving Average Pills	Price per Pill	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	Brand Price Change	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	Brand Price Change

12 = From September 2012 through March 2013, set equal to Column 8. From April 2013 to December 2014, based on a linear interpolation between Column 8 in December 2014 and January 2015.

## Attachment C.3: Diovan and Valsartan Direct Purchaser Overcharges - Scenario 1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Actual				But-For Yardsticks				But-For				Overcharges			
	Diovan Average Price per Pill		Valsartan 3- Month Moving Average Price per Pill		No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	Brand Price Change		Valsartan Price per Pill		Diovan Price per Pill	Generic- Brand-Brand Total			
Month	Diovan Pills		Valsartan Pills						Diovan Pills	Pills			Brand-Generic			
2012-08																
2012-09					2	2.0%	-30.9%	-1.3%		668,150	\$2.19		\$699,012		\$3,550,722	\$4,249,734
2012-10					2	86.2%	-23.0%	-14.9%		56,088,716	\$2.44		\$56,687,700		\$6,795,151	\$63,482,852
2012-11					3	59.0%	-27.8%	-18.7%		35,243,615	\$2.29		\$39,954,546		\$20,699,832	\$60,654,378
2012-12					3	50.9%	-31.3%	-16.6%		26,548,724	\$2.18		\$32,446,013		\$19,409,910	\$51,855,923
2013-01					4	53.4%	-59.5%	-10.6%		35,494,618	\$1.28		\$82,501,653		\$23,880,602	\$106,382,255
2013-02					5	58.4%	-55.4%	-12.0%		28,516,570	\$1.41		\$71,323,105		\$22,868,644	\$94,191,750
2013-03					5	53.8%	-56.2%	-13.4%		29,314,502	\$1.39		\$74,545,679		\$29,857,162	\$104,402,842
2013-04					7	83.6%	-57.2%	-13.3%		42,080,986	\$1.36		\$105,975,367		\$9,284,744	\$115,260,111
2013-05					7	79.9%	-58.2%	-13.2%		49,362,560	\$1.32		\$128,583,104		\$14,631,887	\$143,214,991
2013-06					7	81.7%	-59.2%	-13.0%		38,255,291	\$1.29		\$98,624,060		\$9,573,518	\$108,197,578
2013-07					7	81.5%	-60.2%	-12.9%		50,458,288	\$1.26		\$133,863,133		\$13,232,220	\$147,095,352
2013-08					7	85.0%	-61.2%	-12.8%		45,763,051	\$1.23		\$121,746,109		\$9,074,270	\$130,820,379
2013-09					7	85.6%	-62.2%	-12.7%		41,024,457	\$1.20		\$108,516,595		\$7,424,052	\$115,940,647
2013-10					7	86.9%	-63.2%	-12.6%		51,463,916	\$1.17		\$150,690,974		\$10,295,490	\$160,986,464
2013-11					7	86.9%	-64.1%	-12.5%		38,950,659	\$1.14		\$114,653,965		\$7,656,581	\$122,310,546
2013-12					7	86.5%	-65.1%	-12.4%		43,107,571	\$1.11		\$126,468,680		\$8,462,768	\$134,931,448
2014-01					7	92.4%	-66.1%	-12.3%		49,468,616	\$1.07		\$165,429,732		\$6,620,249	\$172,049,981
2014-02					7	88.7%	-67.1%	-12.2%		35,733,007	\$1.04		\$122,272,828		\$7,683,489	\$129,956,317
2014-03					7	91.6%	-68.1%	-12.1%		38,418,199	\$1.01		\$131,009,091		\$5,797,292	\$136,806,383
2014-04					7	93.4%	-69.1%	-12.0%		45,166,447	\$0.98		\$154,981,220		\$5,178,444	\$160,159,664
2014-05					7	95.9%	-70.1%	-11.9%		34,739,039	\$0.95		\$118,942,479		\$2,354,121	\$121,296,600
2014-06			786,240	\$3.02	8	94.5%	-71.1%	-11.8%		36,914,048	\$0.92		\$122,791,152	\$1,655,747	\$3,280,897	\$127,727,795
2014-07			105,448,560	\$3.37	8	95.1%	-72.0%	-11.7%		116,347,512	\$0.89		\$30,918,478	\$261,760,860	\$5,585,848	\$298,265,185
2014-08			17,945,070	\$3.16	8	93.8%	-73.0%	-11.6%		28,540,097	\$0.85		\$28,616,590	\$41,315,154	\$1,416,689	\$71,348,433
2014-09			14,679,330	\$3.00	8	94.3%	-74.0%	-11.4%		27,221,323	\$0.82		\$35,382,718	\$31,991,501	\$1,371,201	\$68,745,420
2014-10			19,655,670	\$1.77	8	95.4%	-75.0%	-11.3%		35,095,618	\$0.79		\$48,150,815	\$19,191,915	\$1,867,169	\$69,209,900
2014-11			21,659,130	\$1.95	8	95.3%	-76.0%	-11.2%		35,339,269	\$0.76		\$42,233,467	\$25,783,127	\$1,801,968	\$69,818,562
2014-12			19,473,999	\$1.91	8	96.3%	-77.0%	-11.1%		34,897,971	\$0.73		\$47,173,804	\$23,042,615	\$1,292,753	\$71,509,172
Total													\$2,495,182,068	\$404,740,919	\$260,947,674	\$3,160,870,660

## Notes:

- 1 = C.1 Column 2.
- 2 = C.1 Column 3.
- 3 = C.1 Column 5.
- 4 = C.1 Column 7.
- 5 = C.2 Column 9.
- 6 = C.2 Column 10.
- 7 = C.2 Column 11.

**Attachment C.3: Diovan and Valsartan Direct Purchaser Overcharges - Scenario 1**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Actual				But-For Yardsticks				But-For				Overcharges			
	Diovan Average Price per Diovan Pills	Diovan Average Price per Pill	Valsartan Average Price per Pills	Valsartan 3- Month Moving Average Price per Pill	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	Brand Price Change	Diovan Pills	Valsartan Pills	Valsartan Price per Pill	Diovan Price per Pill	Brand-Generic	Generic- Generic	Brand-Brand	Total
Month																

8 = C.2 Column 12.

9 = (Column 1 + Column 3) \* (1 - Column 6).

10 = (Column 1 + Column 3) \* Column 6.

11 = Column 2 in August 2012 \* (1 + Column 7).

12 = Column 2 in August 2012 \* (1 + Column 8).

13 = (Column 10 - Column 3) \* (Column 2 - Column 11). If Column 3 &gt; Column 10, set to zero.

14 = Column 3 \* (Column 4 - Column 11).

15 = Column 10 \* (Column 2 - Column 12).

16 = Column 13 + Column 14 + Column 15.



**Attachment C.4: Diovan and Valsartan Yardstick Calculation - Scenario 2**

	1	2	3	4	5	6	7	8	9	10	11	12
	Diovan		Valsartan		Yardstick Inputs				But-For Yardsticks			
Month	Average Price per Pills	Pill	3-Month Moving Average Pills	Price per Pill	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	Brand Price Change	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	Brand Price Change
2012-08												
2012-09									5	2%	-56.2%	-13.4%
2012-10									5	86%	-56.2%	-13.4%
2012-11									5	59%	-56.2%	-13.4%
2012-12									5	51%	-56.2%	-13.4%
2013-01									5	53%	-56.2%	-13.4%
2013-02									5	58%	-56.2%	-13.4%
2013-03									5	54%	-56.2%	-13.4%
2013-04									7	84%	-57.2%	-13.3%
2013-05									7	80%	-58.2%	-13.2%
2013-06									7	82%	-59.2%	-13.0%
2013-07									7	81%	-60.2%	-12.9%
2013-08									7	85%	-61.2%	-12.8%
2013-09									7	86%	-62.2%	-12.7%
2013-10									7	87%	-63.2%	-12.6%
2013-11									7	87%	-64.1%	-12.5%
2013-12									7	87%	-65.1%	-12.4%
2014-01									7	92%	-66.1%	-12.3%
2014-02									7	89%	-67.1%	-12.2%
2014-03									7	92%	-68.1%	-12.1%
2014-04									7	93%	-69.1%	-12.0%
2014-05									7	96%	-70.1%	-11.9%
2014-06			786,240	\$3.02	1	2%	-30.9%	-1.3%	8	94%	-71.1%	-11.8%
2014-07			105,448,560	\$3.37	2	86%	-23.0%	-14.9%	8	95%	-72.0%	-11.7%
2014-08			17,945,070	\$3.16	2	59%	-27.8%	-18.7%	8	94%	-73.0%	-11.6%
2014-09			14,679,330	\$3.00	2	51%	-31.3%	-16.6%	8	94%	-74.0%	-11.4%
2014-10			19,655,670	\$1.77	2	53%	-59.5%	-10.6%	8	95%	-75.0%	-11.3%
2014-11			21,659,130	\$1.95	2	58%	-55.4%	-12.0%	8	95%	-76.0%	-11.2%
2014-12			19,473,999	\$1.91	2	54%	-56.2%	-13.4%	8	96%	-77.0%	-11.1%
2015-01			52,805,470	\$0.96	10+	84%	-78.0%	-11.0%	10+	97%	-78.0%	-11.0%
2015-02			29,873,405	\$0.39	10+	80%	-91.1%	-25.3%				
2015-03			37,441,810	\$0.08	10+	82%	-98.1%	-19.0%				
2015-04			31,396,010	\$0.08	10+	81%	-98.1%	-30.0%				
2015-05			37,408,756	\$0.08	10+	85%	-98.1%	-30.1%				

**Attachment C.4: Diovan and Valsartan Yardstick Calculation - Scenario 2**

	1	2	3	4	5	6	7	8	9	10	11	12
	Diovan		Valsartan		Yardstick Inputs				But-For Yardsticks			
Month	Pills	Average Price per Pill	Pills	3-Month Moving Average Price per Pill	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	Brand Price Change	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	Brand Price Change
2015-06			39,601,009	\$0.08	10+	86%	-98.1%	-25.2%				
2015-07			35,571,350	\$0.08	10+	87%	-98.2%	-45.0%				
2015-08			40,606,689	\$0.10	10+	87%	-97.7%	-22.9%				
2015-09			36,218,311	\$0.06	10+	87%	-98.6%	-26.9%				
2015-10			38,315,635	\$0.08	10+	92%	-98.3%	-37.6%				
2015-11			43,417,251	\$0.09	10+	89%	-98.0%	-16.0%				
2015-12			51,575,914	\$0.13	10+	92%	-97.1%	-30.5%				
2016-01			46,329,710	\$0.16	10+	93%	-96.4%	-50.0%				
2016-02			39,558,651	\$0.18	10+	96%	-95.9%	-79.9%				
2016-03			48,379,239	\$0.14	10+	94%	-96.9%	-10.8%				
2016-04			42,277,921	\$0.10	10+	95%	-97.6%	-34.4%				
2016-05			41,193,350	\$0.05	10+	94%	-98.9%	-12.8%				
2016-06			42,869,849	\$0.04	10+	94%	-99.1%	-25.5%				
2016-07			45,519,483	\$0.05	10+	95%	-98.9%	-19.0%				
2016-08			47,350,528	\$0.07	10+	95%	-98.5%	3.8%				
2016-09			45,564,629	\$0.06	10+	96%	-98.5%	-11.3%				
2016-10			44,923,946	\$0.05	10+	97%	-98.8%	20.7%				
2016-11			49,651,616	\$0.06	10+	97%	-98.5%	17.1%				
2016-12			48,903,684	\$0.08	10+	98%	-98.2%	23.2%				

**Notes:**

- 1 = C.1 Column 2.
- 2 = C.1 Column 3.
- 3 = C.1 Column 5.
- 4 = C.1 Column 7.
- 5 Count of generic manufacturers that launched in the actual world, based on the produced manufacturer sales data.
- 6 = Column 3 / (Column 1 + Column 3).
- 7 = (Column 4 - Column 2 in May 2014) / (Column 2 in May 2014).
- 8 = (Column 2 - Column 2 in May 2014) / (Column 2 in May 2014).
- 9 Count of generic manufacturers that would have launched in the but-for world according to the but-for Scenario.
- 10 = Column 6, beginning in September 2012.
- 11 = From September 2012 to March 2013, set equal to Column 7 in December 2014. From April 2013 to December 2014, based on a linear interpolation between Column 7 in December 2014 and January 2015.

**Attachment C.4: Diovan and Valsartan Yardstick Calculation - Scenario 2**

	1	2	3	4	5	6	7	8	9	10	11	12
	Diovan		Valsartan		Yardstick Inputs				But-For Yardsticks			
Month	Average Price per Pills	Pill	3-Month Moving Average Pills	Price per Pill	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	Brand Price Change	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	Brand Price Change

12 = From September 2012 to March 2013, set equal to Column 8 in December 2014. From April 2013 to December 2014, based on a linear interpolation between Column 8 in December 2014 and January 2015.

## Attachment C.3: Diovan and Valsartan Direct Purchaser Overcharges - Scenario 2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Actual				But-For Yardsticks				But-For				Overcharges			
	Diovan Average Price per Pill		Valsartan 3- Month Moving Average Price per Pill		No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	Brand Price Change		Valsartan Pills	Valsartan Price per Pill	Diovan Price per Pill		Generic-		
Month	Diovan Pills		Valsartan Pills						Diovan Pills				Brand-Generic	Generic-	Brand-Brand	Total
2012-08																
2012-09					5	2.0%	-56.2%	-13.4%		668,150	\$1.39		\$1,236,680		\$16,000,687	\$17,237,367
2012-10					5	86.2%	-56.2%	-13.4%		56,088,716	\$1.39		\$115,855,023		\$6,368,628	\$122,223,651
2012-11					5	59.0%	-56.2%	-13.4%		35,243,615	\$1.39		\$71,734,815		\$16,571,749	\$88,306,564
2012-12					5	50.9%	-56.2%	-13.4%		26,548,724	\$1.39		\$53,418,195		\$16,742,812	\$70,161,007
2013-01					5	53.4%	-56.2%	-13.4%		35,494,618	\$1.39		\$78,789,473		\$26,631,504	\$105,420,977
2013-02					5	58.4%	-56.2%	-13.4%		28,516,570	\$1.39		\$72,117,318		\$23,751,710	\$95,869,028
2013-03					5	53.8%	-56.2%	-13.4%		29,314,502	\$1.39		\$74,545,679		\$29,857,162	\$104,402,842
2013-04					7	83.6%	-57.2%	-13.3%		42,080,986	\$1.36		\$105,975,367		\$9,284,744	\$115,260,111
2013-05					7	79.9%	-58.2%	-13.2%		49,362,560	\$1.32		\$128,583,104		\$14,631,887	\$143,214,991
2013-06					7	81.7%	-59.2%	-13.0%		38,255,291	\$1.29		\$98,624,060		\$9,573,518	\$108,197,578
2013-07					7	81.5%	-60.2%	-12.9%		50,458,288	\$1.26		\$133,863,133		\$13,232,220	\$147,095,352
2013-08					7	85.0%	-61.2%	-12.8%		45,763,051	\$1.23		\$121,746,109		\$9,074,270	\$130,820,379
2013-09					7	85.6%	-62.2%	-12.7%		41,024,457	\$1.20		\$108,516,595		\$7,424,052	\$115,940,647
2013-10					7	86.9%	-63.2%	-12.6%		51,463,916	\$1.17		\$150,690,974		\$10,295,490	\$160,986,464
2013-11					7	86.9%	-64.1%	-12.5%		38,950,659	\$1.14		\$114,653,965		\$7,656,581	\$122,310,546
2013-12					7	86.5%	-65.1%	-12.4%		43,107,571	\$1.11		\$126,468,680		\$8,462,768	\$134,931,448
2014-01					7	92.4%	-66.1%	-12.3%		49,468,616	\$1.07		\$165,429,732		\$6,620,249	\$172,049,981
2014-02					7	88.7%	-67.1%	-12.2%		35,733,007	\$1.04		\$122,272,828		\$7,683,489	\$129,956,317
2014-03					7	91.6%	-68.1%	-12.1%		38,418,199	\$1.01		\$131,009,091		\$5,797,292	\$136,806,383
2014-04					7	93.4%	-69.1%	-12.0%		45,166,447	\$0.98		\$154,981,220		\$5,178,444	\$160,159,664
2014-05					7	95.9%	-70.1%	-11.9%		34,739,039	\$0.95		\$118,942,479		\$2,354,121	\$121,296,600
2014-06			786,240	\$3.02	8	94.5%	-71.1%	-11.8%		36,914,048	\$0.92		\$122,791,152	\$1,655,747	\$3,280,897	\$127,727,795
2014-07			105,448,560	\$3.37	8	95.1%	-72.0%	-11.7%		116,347,512	\$0.89		\$30,918,478	\$261,760,860	\$5,585,848	\$298,265,185
2014-08			17,945,070	\$3.16	8	93.8%	-73.0%	-11.6%		28,540,097	\$0.85		\$28,616,590	\$41,315,154	\$1,416,689	\$71,348,433
2014-09			14,679,330	\$3.00	8	94.3%	-74.0%	-11.4%		27,221,323	\$0.82		\$35,382,718	\$31,991,501	\$1,371,201	\$68,745,420
2014-10			19,655,670	\$1.77	8	95.4%	-75.0%	-11.3%		35,095,618	\$0.79		\$48,150,815	\$19,191,915	\$1,867,169	\$69,209,900
2014-11			21,659,130	\$1.95	8	95.3%	-76.0%	-11.2%		35,339,269	\$0.76		\$42,233,467	\$25,783,127	\$1,801,968	\$69,818,562
2014-12			19,473,999	\$1.91	8	96.3%	-77.0%	-11.1%		34,897,971	\$0.73		\$47,173,804	\$23,042,615	\$1,292,753	\$71,509,172
Total													\$2,604,721,543	\$404,740,919	\$269,809,903	\$3,279,272,365

## Notes:

- 1 = C.1 Column 2.
- 2 = C.1 Column 3.
- 3 = C.1 Column 5.
- 4 = C.1 Column 7.
- 5 = C.2 Column 9.
- 6 = C.2 Column 10.
- 7 = C.2 Column 11.

**Attachment C.3: Diovan and Valsartan Direct Purchaser Overcharges - Scenario 2**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Actual				But-For Yardsticks				But-For				Overcharges			
	Diovan Average Price per Diovan Pills	Diovan Average Price per Pill	Valsartan Average Price per Pills	Valsartan 3- Month Moving Average Price per Pill	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	Brand Price Change	Diovan Pills	Valsartan Pills	Valsartan Price per Pill	Diovan Price per Pill	Brand-Generic	Generic- Generic	Brand-Brand	Total
Month																

8 = C.2 Column 12.

9 = (Column 1 + Column 3) \* (1 - Column 6).

10 = (Column 1 + Column 3) \* Column 6.

11 = Column 2 in August 2012 \* (1 + Column 7).

12 = Column 2 in August 2012 \* (1 + Column 8).

13 = (Column 10 - Column 3) \* (Column 2 - Column 11). If Column 3 &gt; Column 10, set to zero.

14 = Column 3 \* (Column 4 - Column 11).

15 = Column 10 \* (Column 2 - Column 12).

16 = Column 13 + Column 14 + Column 15.

**Attachment D**

**Attachment D.1: Nexium and Esomeprazole Magnesium Manufacturer Net Sales Data**

	1	2	3	4	5	6	7
	Nexium			Esomeprazole Magnesium			
Month	Sales	Pills	Average Price per Pill	Sales	Pills	Average Price per Pill	3-Month Moving Average Price per Pill
2014-04							
2014-05							
2014-06							
2014-07							
2014-08							
2014-09							
2014-10							
2014-11							
2014-12							
2015-01							
2015-02							
2015-03							
2015-04							
2015-05							
2015-06							
2015-07							
2015-08				\$160,645,631	31,916,870	\$5.03	\$4.18
2015-09				\$100,522,775	23,218,840	\$4.33	\$4.33
2015-10				\$27,711,599	22,705,270	\$1.22	\$3.71
2015-11				\$25,290,936	26,074,130	\$0.97	\$2.13
2015-12				\$59,090,636	35,029,920	\$1.69	\$1.34
2016-01				\$25,287,587	24,538,750	\$1.03	\$1.28
2016-02				\$2,431,361	31,925,630	\$0.08	\$0.95
2016-03				\$17,241,433	36,810,500	\$0.47	\$0.48
2016-04				\$44,627,467	41,167,870	\$1.08	\$0.59
2016-05				\$2,551,785	29,301,230	\$0.09	\$0.60
2016-06				\$40,629,661	34,232,340	\$1.19	\$0.84
2016-07				\$24,943,858	35,908,000	\$0.69	\$0.69
2016-08				\$8,107,877	35,874,260	\$0.23	\$0.70
2016-09				\$29,291,721	46,991,740	\$0.62	\$0.52
2016-10				\$31,367,793	30,817,870	\$1.02	\$0.60
2016-11				\$12,303,179	30,154,380	\$0.41	\$0.68
2016-12				\$61,955,945	43,807,240	\$1.41	\$1.01
2017-01				\$13,270,089	28,354,670	\$0.47	\$0.86



**Attachment D.1: Nexium and Esomeprazole Magnesium Manufacturer Net Sales Data**

	1	2	3	4	5	6	7
	Nexium			Esomeprazole Magnesium			
Month	Sales	Pills	Average Price per Pill	Sales	Pills	Average Price per Pill	3-Month Moving Average Price per Pill
2017-02				-\$3,877,825	29,734,040	-\$0.13	\$0.70
2017-03				\$13,109,306	38,342,230	\$0.34	\$0.23
2017-04				\$7,482,103	35,904,970	\$0.21	\$0.16
2017-05				-\$1,762,335	39,475,310	-\$0.04	\$0.17
2017-06				\$22,230,949	49,789,540	\$0.45	\$0.22
2017-07				\$18,245,364	35,202,720	\$0.52	\$0.31
2017-08				-\$11,876,688	39,948,400	-\$0.30	\$0.23
2017-09				\$13,958,577	35,930,860	\$0.39	\$0.18
2017-10				\$20,346,949	39,436,240	\$0.52	\$0.19
2017-11				-\$32,611,603	27,027,420	-\$1.21	\$0.02
2017-12				-\$17,606,844	52,406,060	-\$0.34	\$0.06
2018-01				\$8,615,816	41,177,700	\$0.21	\$0.06
2018-02				\$7,193,099	34,326,630	\$0.21	\$0.06
2018-03				-\$5,356,295	30,117,310	-\$0.18	\$0.10
2018-04				\$8,826,609	38,359,440	\$0.23	\$0.10
2018-05				-\$2,532,588	30,878,310	-\$0.08	\$0.01
2018-06				-\$11,438,654	22,941,780	-\$0.50	\$0.12
2018-07				\$5,053,169	19,949,310	\$0.25	\$0.12
2018-08				\$4,539,430	28,881,030	\$0.16	\$0.12
2018-09				\$7,405,786	25,116,570	\$0.29	\$0.23
2018-10				\$9,513,054	24,453,420	\$0.39	\$0.27
2018-11				-\$6,252,432	26,556,510	-\$0.24	\$0.14
2018-12				\$7,700	26,075,870	\$0.00	\$0.04
2019-01				\$16,380,152	31,318,980	\$0.52	\$0.12
2019-02				\$910,795	23,136,600	\$0.04	\$0.21
2019-03				\$3,958,889	24,929,240	\$0.16	\$0.27
2019-04				\$6,862,332	19,092,060	\$0.36	\$0.17
2019-05				\$5,043,378	8,130,330	\$0.62	\$0.30
2019-06				-\$1,686,508	6,457,260	-\$0.26	\$0.30

**Notes:**

1-2 Source: AstraZeneca transactional sales and chargebacks data (AZNONPARTY\_002560, AZNONPARTY\_002565, AZNONPARTY\_002566, and AZNONPARTY\_002569).

**Attachment D.1: Nexium and Esomeprazole Magnesium Manufacturer Net Sales Data**

	1	2	3	4	5	6	7
	Nexium			Esomeprazole Magnesium			
Month	Sales	Pills	Average Price per Pill	Sales	Pills	Average Price per Pill	3-Month Moving Average Price per Pill

Excludes the "Federal Gov't - Department of Defense (DOD)" class of trade.

Since the chargebacks data through 2016 are only available in quarterly format, the quarterly totals are divided by 3 to estimate monthly totals.

3 = Column 1 / Column 2.

4-5 Source: Generic manufacturer transactional sales data:

Teva (TEVA\_RANBAXY-ANTITRUST.0000021.xlsx); Mylan (MYL-ESOM-0000098, MYL-ESOM-0000099, MYL-ESOM-0000100, MYL-ESOM-0000101, MYL-ESOM-0000102); Dr. Reddy's Lab (DRL-001057); Hetero/Camber (Esomeprazole Sales 2015-2017.xlsx); Aurobindo (Chargeback Data for Esomeprazole - Launch till December 2019.xlsx, Sales Data from Launch till December 2019.xlsb, Credit Note Data from Launch till December 2019.xlsb); Ranbaxy (SUN\_02753986, SUN\_027737727); Torrent (TORRENT048302).

6 = Column 4 / Column 5.

7 = Prior three month sum from Column 4 / prior three month sum for Column 5.

Since the data show negative prices, from December 2017 through February 2018, and from June 2018 through August 2018, prices are calculated as the average of the prices found in adjacent months.

**Attachment D.2: Nexium and Esomeprazole Magnesium Yardstick Calculations - Scenario 1**

	1	2	3	4	5	6	7	8	9	10	11	12
	Nexium		Esomeprazole Magnesium		Yardstick Inputs				But-For Yardsticks			
Month	Pills	Average Price per Pill	Pills	3-Month Moving Average Price per Pill	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	Brand Price Change	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	Brand Price Change
2014-04												
2014-05									2	67.0%	-37.4%	-12.4%
2014-06									2	50.9%	-37.4%	-12.4%
2014-07									2	26.5%	-37.4%	-12.4%
2014-08									2	11.9%	-37.4%	-12.4%
2014-09									2	16.9%	-37.4%	-12.4%
2014-10									2	19.0%	-37.4%	-12.4%
2014-11									2	38.1%	-37.4%	-12.4%
2014-12									2	29.9%	-37.4%	-12.4%
2015-01									2	34.3%	-37.4%	-12.4%
2015-02					1	67.0%	-18.8%	-36.0%	2	38.8%	-37.4%	-12.4%
2015-03					1	50.9%	-22.7%	-34.8%	2	38.2%	-37.4%	-12.4%
2015-04					1	26.5%	-21.9%	-13.6%	2	49.4%	-37.4%	-12.4%
2015-05					1	11.9%	-28.3%	-14.6%	2	60.9%	-37.4%	-12.4%
2015-06					1	16.9%	-33.2%	-8.9%	2	54.4%	-37.4%	-12.4%
2015-07					1	19.0%	-56.3%	-13.8%	2	60.3%	-37.4%	-12.4%
2015-08			31,916,870	\$4.18	2	38.1%	-37.4%	-12.4%	3	52.3%	-37.4%	-12.4%
2015-09			23,218,840	\$4.33	4	29.9%	-35.2%	-10.6%	5	51.5%	-35.2%	-10.6%
2015-10			22,705,270	\$3.71	5	34.3%	-44.5%	-9.1%	6	61.9%	-44.5%	-9.1%
2015-11			26,074,130	\$2.13	5	38.8%	-68.1%	-11.2%	6	55.3%	-68.1%	-11.2%
2015-12			35,029,920	\$1.34	5	38.2%	-80.0%	-1.2%	6	62.4%	-80.0%	-1.2%
2016-01			24,538,750	\$1.28	5	49.4%	-80.9%	-37.8%	6	59.2%	-80.9%	-37.8%
2016-02			31,925,630	\$0.95	5	60.9%	-85.8%	-52.3%	6	56.6%	-85.8%	-52.3%
2016-03			36,810,500	\$0.48	5	54.4%	-92.8%	-26.2%	6	60.5%	-92.8%	-26.2%
2016-04			41,167,870	\$0.59	5	60.3%	-91.3%	-32.3%	6	60.5%	-91.3%	-32.3%
2016-05			29,301,230	\$0.60	5	52.3%	-91.0%	-33.0%	6	60.5%	-91.0%	-33.0%
2016-06			34,232,340	\$0.84	5	51.5%	-87.5%	-23.1%	6	60.5%	-87.5%	-23.1%
2016-07			35,908,000	\$0.69	5	61.9%	-89.8%	-44.8%	6	60.5%	-89.8%	-44.8%
2016-08			35,874,260	\$0.70	5	55.3%	-89.6%	-28.1%	6	60.5%	-89.6%	-28.1%
2016-09			46,991,740	\$0.52	5	62.4%	-92.2%	-29.5%	6	60.5%	-92.2%	-29.5%
2016-10			30,817,870	\$0.60	5	59.2%	-91.0%	-15.9%	6	60.5%	-91.0%	-15.9%
2016-11			30,154,380	\$0.68	5	56.6%	-89.9%	-12.5%	6	60.5%	-89.9%	-12.5%
2016-12			43,807,240	\$1.01	6	60.5%	-84.9%	-5.4%	7	60.5%	-84.9%	-5.4%
2017-01			28,354,670	\$0.86	6	58.9%	-87.2%		7	60.5%	-87.2%	
2017-02			29,734,040	\$0.70	6	66.1%	-89.5%		7	60.5%	-89.5%	

**Attachment D.2: Nexium and Esomeprazole Magnesium Yardstick Calculations - Scenario 1**

	1	2	3	4	5	6	7	8	9	10	11	12
	Nexium		Esomeprazole Magnesium		Yardstick Inputs				But-For Yardsticks			
Month	Pills	Average Price per Pill	Pills	3-Month Moving Average Price per Pill	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	Brand Price Change	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	Brand Price Change
2017-03			38,342,230	\$0.23	6	59.7%	-96.5%		7	60.5%	-96.5%	
2017-04			35,904,970	\$0.16	6	73.8%	-97.6%		7	60.5%	-97.6%	
2017-05			39,475,310	\$0.17	6	73.9%	-97.5%		7	60.5%	-97.5%	
2017-06			49,789,540	\$0.22	6	80.6%	-96.7%		7	60.5%	-96.7%	
2017-07			35,202,720	\$0.31	6	83.5%	-95.4%		7	60.5%	-95.4%	
2017-08			39,948,400	\$0.23	6	84.3%	-96.6%		7	60.5%	-96.6%	
2017-09			35,930,860	\$0.18	6	86.5%	-97.3%		7	60.5%	-97.3%	
2017-10			39,436,240	\$0.19	6	86.9%	-97.1%		7	60.5%	-97.1%	
2017-11			27,027,420	\$0.02	6	80.0%	-99.8%		7	60.5%	-99.8%	
2017-12			52,406,060	\$0.06	6	89.7%	-99.1%		7	60.5%	-99.1%	
2018-01			41,177,700	\$0.06	6	89.7%	-99.1%		7	60.5%	-99.1%	
2018-02			34,326,630	\$0.06	6	88.9%	-99.1%		7	60.5%	-99.1%	
2018-03			30,117,310	\$0.10	6	88.6%	-98.5%		7	60.5%	-98.5%	
2018-04			38,359,440	\$0.10	6	89.6%	-98.4%		7	60.5%	-98.4%	
2018-05			30,878,310	\$0.01	6	88.4%	-99.9%		7	60.5%	-99.9%	
2018-06			22,941,780	\$0.12	6	87.2%	-98.2%		7	60.5%	-98.2%	
2018-07			19,949,310	\$0.12	6	86.1%	-98.2%		7	60.5%	-98.2%	
2018-08			28,881,030	\$0.12	6	88.9%	-98.2%		7	60.5%	-98.2%	
2018-09			25,116,570	\$0.23	6	89.2%	-96.6%		7	60.5%	-96.6%	
2018-10			24,453,420	\$0.27	6	87.8%	-95.9%		7	60.5%	-95.9%	
2018-11			26,556,510	\$0.14	6	89.2%	-97.9%		7	60.5%	-97.9%	
2018-12			26,075,870	\$0.04	6	87.2%	-99.4%		7	60.5%	-99.4%	
2019-01			31,318,980	\$0.12	6	91.7%	-98.2%		7	60.5%	-98.2%	
2019-02			23,136,600	\$0.21	6	90.4%	-96.8%		7	60.5%	-96.8%	
2019-03			24,929,240	\$0.27	6	90.1%	-96.0%		7	60.5%	-96.0%	
2019-04			19,092,060	\$0.17	6	86.4%	-97.4%		7	60.5%	-97.4%	
2019-05			8,130,330	\$0.30	7	72.7%	-95.5%		8	60.5%	-95.5%	
2019-06			6,457,260	\$0.30	7	73.1%	-95.5%		8	60.5%	-95.5%	

**Notes:**

- 1 = D.1 Column 2.
- 2 = D.1 Column 3.
- 3 = D.1 Column 5.
- 4 = D.1 Column 7.

## Attachment D.2: Nexium and Esomeprazole Magnesium Yardstick Calculations - Scenario 1

[illegible]

5 Count of generic manufacturers that launched in the actual world, based on the produced manufacturer sales data.

6 = Column 3 / (Column 1 + Column 3).

7 = (Column 4 - Column 2 in December 2014) / (Column 2 in December 2014).

8 = (Column 2 - Column 2 in December 2014) / (Column 2 in December 2014).

9 Count of generic manufacturers that would have launched in the but-for world according to the but-for Scenario.

10 = Column 6, beginning in May 2014.

11 From May 2014 through August 2015, set equal to Column 7 in August 2015.

From September 2015 onward, set equal to Column 7 in September 2015 onward.

12 From May 2014 through August 2015, set equal to Column 8 in August 2015.

From September 2015 onward, set equal to Column 8 in September 2015 onward.



## Attachment D.3: Nexium and Esomeprazole Magnesium Direct Purchaser Overcharges - Scenario 1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Actual				But-For Yardsticks				But-For				Overcharges			
Month	Nexium Pills	Nexium Average Price per Pill	Esomeprazole Magnesium Pills	Esomeprazole Magnesium 3- Month Moving Average Price per Pill	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	Brand Price Change	Nexium Pills	Esomeprazole Magnesium Pills	Esomeprazole Magnesium Price per Pill	Nexium Price per Pill	Brand-Generic	Generic- Generic	Brand-Brand	Total
2014-04					2	67.0%	-37.4%	-12.4%		45,246,475	\$3.82		\$105,014,048		\$17,607,886	\$122,621,935
2014-05					2	50.9%	-37.4%	-12.4%		32,451,978	\$3.82		\$71,934,056		\$21,459,671	\$93,393,726
2014-06					2	26.5%	-37.4%	-12.4%		18,868,880	\$3.82		\$44,011,592		\$42,054,986	\$86,066,578
2014-07					2	11.9%	-37.4%	-12.4%		6,978,910	\$3.82		\$13,697,645		\$22,373,646	\$36,071,291
2014-08					2	16.9%	-37.4%	-12.4%		10,010,483	\$3.82		\$19,799,656		\$22,029,246	\$41,828,902
2014-09					2	19.0%	-37.4%	-12.4%		12,183,821	\$3.82		\$31,494,783		\$54,796,521	\$86,291,304
2014-10					2	38.1%	-37.4%	-12.4%		23,408,596	\$3.82		\$58,960,423		\$37,578,519	\$96,538,942
2014-11					2	29.9%	-37.4%	-12.4%		23,569,434	\$3.82		\$67,593,166		\$74,020,894	\$141,614,060
2014-12					2	34.3%	-37.4%	-12.4%		16,317,467	\$3.82		\$30,638,318		\$10,886,396	\$41,524,714
2015-01					2	38.8%	-37.4%	-12.4%		34,116,341	\$3.82		\$0	\$94,733,685	\$0	\$94,733,685
2015-02					2	38.2%	-37.4%	-12.4%		27,351,877	\$3.82		\$0	\$49,243,574	\$0	\$49,243,574
2015-03					2	49.4%	-37.4%	-12.4%		34,271,787	\$3.82		\$31,158,474	\$25,765,604	\$15,160,043	\$72,084,121
2015-04					2	60.9%	-37.4%	-12.4%		31,070,670	\$3.82		\$47,317,343	\$5,900,305	\$7,216,877	\$60,434,524
2015-05					2	54.4%	-37.4%	-12.4%		31,109,748	\$3.82		\$48,716,749	\$6,280,412	\$19,404,242	\$74,401,403
2015-06					2	54.4%	-37.4%	-12.4%		31,109,748	\$3.82		\$48,716,749	\$6,280,412	\$19,404,242	\$74,401,403
Total													\$570,336,253	\$181,923,580	\$344,588,927	\$1,096,848,760

## Notes:

- 1 = D.1 Column 2.
- 2 = D.1 Column 3.
- 3 = D.1 Column 5.
- 4 = D.1 Column 7.
- 5 = D.2 Column 9.
- 6 = D.2 Column 10.
- 7 = D.2 Column 11.
- 8 = D.2 Column 12.
- 9 = (Column 1 + Column 3) \* (1 - Column 6).
- 10 = (Column 1 + Column 3) \* Column 6.
- 11 = Column 2 in April 2014 \* (1 + Column 7).
- 12 = Column 2 in April 2014 \* (1 + Column 8).
- 13 = (Column 10 - Column 3) \* (Column 2 - Column 11). If Column 3 > Column 10, set to zero.
- 14 = Column 3 \* (Column 4 - Column 11).
- 15 = Min(Column 1, Column 9) \* (Column 2 - Column 12).
- 16 = Column 13 + Column 14 + Column 15.

**Attachment D.4: Nexium and Esomeprazole Magnesium Yardstick Calculations - Scenario 2**

	1	2	3	4	5	6	7	8	9	10	11	12
	Nexium		Esomeprazole Magnesium		Yardstick Inputs				But-For Yardsticks			
Month	Pills	Average Price per Pill	Pills	3-Month Moving Average Price per Pill	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	Brand Price Change	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	Brand Price Change
2014-04												
2014-05									5	67.0%	-44.5%	-9.1%
2014-06									5	50.9%	-68.1%	-11.2%
2014-07									5	26.5%	-80.0%	-1.2%
2014-08									5	11.9%	-80.9%	-37.8%
2014-09									5	16.9%	-85.8%	-52.3%
2014-10									5	19.0%	-92.8%	-26.2%
2014-11									5	38.1%	-91.3%	-32.3%
2014-12									5	29.9%	-91.0%	-33.0%
2015-01									5	34.3%	-87.5%	-23.1%
2015-02					1	67.0%	-18.8%	-36.0%	5	38.8%	-89.8%	-44.8%
2015-03					1	50.9%	-22.7%	-34.8%	5	38.2%	-89.6%	-28.1%
2015-04					1	26.5%	-21.9%	-13.6%	5	49.4%	-92.2%	-29.5%
2015-05					1	11.9%	-28.3%	-14.6%	5	60.9%	-91.0%	-15.9%
2015-06					1	16.9%	-33.2%	-8.9%	5	54.4%	-89.9%	-12.5%
2015-07					1	19.0%	-56.3%	-13.8%	5	60.3%	-84.9%	-5.4%
2015-08			31,916,870	\$4.18	2	38.1%	-37.4%	-12.4%	5	52.3%	-87.2%	-44.9%
2015-09			23,218,840	\$4.33	4	29.9%	-35.2%	-10.6%	5	51.5%	-89.5%	-53.8%
2015-10			22,705,270	\$3.71	5	34.3%	-44.5%	-9.1%	6	61.9%	-96.5%	-48.0%
2015-11			26,074,130	\$2.13	5	38.8%	-68.1%	-11.2%	6	55.3%	-97.6%	-8.2%
2015-12			35,029,920	\$1.34	5	38.2%	-80.0%	-1.2%	6	62.4%	-97.5%	-5.9%
2016-01			24,538,750	\$1.28	5	49.4%	-80.9%	-37.8%	6	59.2%	-96.7%	-5.1%
2016-02			31,925,630	\$0.95	5	60.9%	-85.8%	-52.3%	6	56.6%	-95.4%	6.3%
2016-03			36,810,500	\$0.48	5	54.4%	-92.8%	-26.2%	6	60.5%	-96.6%	6.4%
2016-04			41,167,870	\$0.59	5	60.3%	-91.3%	-32.3%	6	58.9%	-97.3%	2.2%
2016-05			29,301,230	\$0.60	5	52.3%	-91.0%	-33.0%	6	66.1%	-97.1%	5.4%
2016-06			34,232,340	\$0.84	5	51.5%	-87.5%	-23.1%	6	59.7%	-99.8%	7.5%
2016-07			35,908,000	\$0.69	5	61.9%	-89.8%	-44.8%	6	73.8%	-99.1%	9.7%
2016-08			35,874,260	\$0.70	5	55.3%	-89.6%	-28.1%	6	73.9%	-99.1%	2.8%
2016-09			46,991,740	\$0.52	5	62.4%	-92.2%	-29.5%	6	80.6%	-99.1%	3.8%
2016-10			30,817,870	\$0.60	5	59.2%	-91.0%	-15.9%	6	83.5%	-98.5%	2.8%
2016-11			30,154,380	\$0.68	5	56.6%	-89.9%	-12.5%	6	84.3%	-98.4%	3.4%
2016-12			43,807,240	\$1.01	6	60.5%	-84.9%	-5.4%	7	86.5%	-99.9%	5.0%
2017-01			28,354,670	\$0.86	6	58.9%	-87.2%	-44.9%	7	86.9%	-98.2%	4.3%
2017-02			29,734,040	\$0.70	6	66.1%	-89.5%	-53.8%	7	80.0%	-98.2%	10.7%



**Attachment D.4: Nexium and Esomeprazole Magnesium Yardstick Calculations - Scenario 2**

	1	2	3	4	5	6	7	8	9	10	11	12
	Nexium		Esomeprazole Magnesium		Yardstick Inputs				But-For Yardsticks			
Month	Pills	Average Price per Pill	Pills	3-Month Moving Average Price per Pill	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	Brand Price Change	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	Brand Price Change
2017-03			38,342,230	\$0.23	6	59.7%	-96.5%	-48.0%	7	89.7%	-98.2%	12.4%
2017-04			35,904,970	\$0.16	6	73.8%	-97.6%	-8.2%	7	89.7%	-96.6%	11.2%
2017-05			39,475,310	\$0.17	6	73.9%	-97.5%	-5.9%	7	88.9%	-95.9%	10.7%
2017-06			49,789,540	\$0.22	6	80.6%	-96.7%	-5.1%	7	88.6%	-97.9%	12.3%
2017-07			35,202,720	\$0.31	6	83.5%	-95.4%	6.3%	7	89.6%	-99.4%	13.5%
2017-08			39,948,400	\$0.23	6	84.3%	-96.6%	6.4%	7	88.4%	-98.2%	8.0%
2017-09			35,930,860	\$0.18	6	86.5%	-97.3%	2.2%	7	87.2%	-96.8%	8.5%
2017-10			39,436,240	\$0.19	6	86.9%	-97.1%	5.4%	7	86.1%	-96.0%	9.2%
2017-11			27,027,420	\$0.02	6	80.0%	-99.8%	7.5%	7	88.9%	-97.4%	10.0%
2017-12			52,406,060	\$0.06	6	89.7%	-99.1%	9.7%	7	89.2%	-95.5%	6.4%
2018-01			41,177,700	\$0.06	6	89.7%	-99.1%	2.8%	7	87.8%	-95.5%	7.9%
2018-02			34,326,630	\$0.06	6	88.9%	-99.1%	3.8%	7	89.2%	-95.5%	
2018-03			30,117,310	\$0.10	6	88.6%	-98.5%	2.8%	7	87.2%	-95.5%	
2018-04			38,359,440	\$0.10	6	89.6%	-98.4%	3.4%	7	91.7%	-95.5%	
2018-05			30,878,310	\$0.01	6	88.4%	-99.9%	5.0%	7	90.4%	-95.5%	
2018-06			22,941,780	\$0.12	6	87.2%	-98.2%	4.3%	7	90.1%	-95.5%	
2018-07			19,949,310	\$0.12	6	86.1%	-98.2%	10.7%	7	86.4%	-95.5%	
2018-08			28,881,030	\$0.12	6	88.9%	-98.2%	12.4%	7	72.7%	-95.5%	
2018-09			25,116,570	\$0.23	6	89.2%	-96.6%	11.2%	7	73.1%	-95.5%	
2018-10			24,453,420	\$0.27	6	87.8%	-95.9%	10.7%	7		-95.5%	
2018-11			26,556,510	\$0.14	6	89.2%	-97.9%	12.3%	7		-95.5%	
2018-12			26,075,870	\$0.04	6	87.2%	-99.4%	13.5%	7		-95.5%	
2019-01			31,318,980	\$0.12	6	91.7%	-98.2%	8.0%	7		-95.5%	
2019-02			23,136,600	\$0.21	6	90.4%	-96.8%	8.5%	7		-95.5%	
2019-03			24,929,240	\$0.27	6	90.1%	-96.0%	9.2%	7		-95.5%	
2019-04			19,092,060	\$0.17	6	86.4%	-97.4%	10.0%	7		-95.5%	
2019-05			8,130,330	\$0.30	7	72.7%	-95.5%	6.4%	8		-95.5%	
2019-06			6,457,260	\$0.30	7	73.1%	-95.5%	7.9%	8		-95.5%	

## Notes:

- 1 = D.1 Column 2.
- 2 = D.1 Column 3.
- 3 = D.1 Column 5.
- 4 = D.1 Column 7.

**Attachment D.4: Nexium and Esomeprazole Magnesium Yardstick Calculations - Scenario 2**

	1	2	3	4	5	6	7	8	9	10	11	12
	Nexium		Esomeprazole Magnesium		Yardstick Inputs				But-For Yardsticks			
Month	Average Price per Pills	Pill	3-Month Moving Average Price per Pills	Pill	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	Brand Price Change	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	Brand Price Change

5 Count of generic manufacturers that launched in the actual world, based on the produced manufacturer sales data.

6 = Column 3 / (Column 1 + Column 3).

7 = (Column 4 - Column 2 in December 2014) / (Column 2 in December 2014).

8 = (Column 2 - Column 2 in December 2014) / (Column 2 in December 2014).

9 Count of generic manufacturers that would have launched in the but-for world according to the but-for Scenario.

10 = Column 6, beginning in May 2014.

11 From May 2014 through August 2015, set equal to Column 7 starting in October 2015.

From February 2018 onward, set equal to January 2018.

12 From May 2014 through August 2015, set equal to Column 8 starting in October 2015.

Brand price change yardsticks are not evaluated beyond the point when data run out in Column 8.

## Attachment D.5: Nexium and Esomeprazole Magnesium Direct Purchaser Overcharges - Scenario 2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Actual				But-For Yardsticks				But-For				Overcharges			
Month	Nexium Pills	Nexium Average Price per Pill	Esomeprazole Magnesium Pills	Esomeprazole Magnesium 3- Month Moving Average Price per Pill	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	Brand Price Change	Nexium Pills	Esomeprazole Magnesium Pills	Esomeprazole Magnesium Price per Pill	Nexium Price per Pill	Brand-Generic	Generic-Generic	Brand-Brand	Total
2014-04																
2014-05					5	67.0%	-44.5%	-9.1%		45,246,475	\$3.39		\$124,585,454		\$13,082,156	\$137,667,610
2014-06					5	50.9%	-68.1%	-11.2%		32,451,978	\$1.95		\$132,768,361		\$19,105,508	\$151,873,869
2014-07					5	26.5%	-80.0%	-1.2%		18,868,880	\$1.22		\$93,082,165		\$6,285,946	\$99,368,111
2014-08					5	11.9%	-80.9%	-37.8%		6,978,910	\$1.17		\$32,209,996		\$102,670,114	\$134,880,110
2014-09					5	16.9%	-85.8%	-52.3%		10,010,483	\$0.87		\$49,386,843		\$141,819,798	\$191,206,640
2014-10					5	19.0%	-92.8%	-26.2%		12,183,821	\$0.44		\$72,700,018		\$98,497,467	\$171,197,485
2014-11					5	38.1%	-91.3%	-32.3%		23,408,596	\$0.53		\$135,924,387		\$83,747,259	\$219,671,646
2014-12					5	29.9%	-91.0%	-33.0%		23,569,434	\$0.55		\$144,753,665		\$143,644,126	\$288,397,790
2015-01					5	34.3%	-87.5%	-23.1%		16,317,467	\$0.77		\$80,508,041		\$31,382,538	\$111,890,579
2015-02					5	38.8%	-89.8%	-44.8%		34,116,341	\$0.63		\$0	\$282,919,244	\$26,464,865	\$309,384,109
2015-03					5	38.2%	-89.6%	-28.1%		27,351,877	\$0.63		\$0	\$165,419,365	\$0	\$165,419,365
2015-04					5	49.4%	-92.2%	-29.5%		34,271,787	\$0.48		\$84,270,262	\$87,217,736	\$51,912,983	\$223,400,982
2015-05					5	60.9%	-91.0%	-15.9%		31,070,670	\$0.55		\$129,081,687	\$25,728,587	\$11,419,714	\$166,229,988
2015-06					5	54.4%	-89.9%	-12.5%		31,109,748	\$0.62		\$117,408,674	\$37,294,113	\$19,562,778	\$174,265,565
2015-07					5	60.3%	-84.9%	-5.4%		37,243,044	\$0.92		\$123,689,184	\$23,496,724	\$0	\$147,185,908
2015-08			31,916,870	\$4.18	5	52.3%	-87.2%	-44.9%		43,769,381	\$0.78		\$60,193,484	\$108,624,560	\$99,757,275	\$268,575,319
2015-09			23,218,840	\$4.33	5	51.5%	-89.5%	-53.8%		40,005,750	\$0.64		\$89,699,868	\$85,758,962	\$119,137,473	\$294,596,303
2015-10			22,705,270	\$3.71	6	61.9%	-96.5%	-48.0%		41,057,382	\$0.21		\$107,714,714	\$79,423,609	\$73,291,281	\$260,429,604
2015-11			26,074,130	\$2.13	6	55.3%	-97.6%	-8.2%		37,120,673	\$0.15		\$64,020,917	\$51,771,106	\$10,006,683	\$125,798,706
2015-12			35,029,920	\$1.34	6	62.4%	-97.5%	-5.9%		57,211,488	\$0.15		\$143,201,988	\$41,554,269	\$29,496,235	\$214,252,491
Total													\$1,785,199,707	\$989,208,275	\$1,081,284,199	\$3,855,692,181

## Notes:

- 1 = D.1 Column 2.
- 2 = D.1 Column 3.
- 3 = D.1 Column 5.
- 4 = D.1 Column 7.
- 5 = D.4 Column 9.
- 6 = D.4 Column 10.
- 7 = D.4 Column 11.
- 8 = D.4 Column 12.
- 9 = (Column 1 + Column 3) \* (1 - Column 6).
- 10 = (Column 1 + Column 3) \* Column 6.
- 11 = Column 2 in April 2014 \* (1 + Column 7).
- 12 = Column 2 in April 2014 \* (1 + Column 8).
- 13 = (Column 10 - Column 3) \* (Column 2 - Column 11). If Column 3 > Column 10, set to zero.
- 14 = Column 3 \* (Column 4 - Column 11).

**Attachment D.5: Nexium and Esomeprazole Magnesium Direct Purchaser Overcharges - Scenario 2**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Actual				But-For Yardsticks				But-For				Overcharges			
	Nexium		Esomeprazole		No. of Gen.	Generic Market Share	Generic Price Decline	Brand Price Change	Nexium Pills	Esomeprazole Magnesium Pills	Esomeprazole Magnesium Price per Pill	Nexium Price per Pill				
Month	Average Price per Pills	Price per Pill	Average Price per Pill	Month Moving Average Price per Pill									Brand-Generic	Generic-Generic	Brand-Brand	Total

15 = Min(Column 1, Column 9) \* (Column 2 - Column 12).

16 = Column 13 + Column 14 + Column 15.

**Attachment E**

**Attachment E.1: Valcyte and Valganciclovir Manufacturer Net Sales Data**

	1	2	3	4	5	6	7
	Valcyte			Valganciclovir			
Month	Sales	Pills	Average Price per Pill	Sales	Pills	Average Price per Pill	3-Month Moving Average Price per Pill
2014-07							
2014-08							
2014-09							
2014-10							
2014-11							
2014-12				\$28,769,738	776,160	\$37.07	\$42.06
2015-01				\$23,109,133	649,380	\$35.59	\$39.85
2015-02				\$19,358,491	614,760	\$31.49	\$34.92
2015-03				\$23,725,877	844,140	\$28.11	\$31.40
2015-04				\$5,250,547	427,220	\$12.29	\$25.63
2015-05				\$22,470,368	689,445	\$32.59	\$26.24
2015-06				\$38,351,113	1,055,340	\$36.34	\$30.42
2015-07				\$11,024,691	470,880	\$23.41	\$32.43
2015-08				\$18,319,364	645,697	\$28.37	\$31.17
2015-09				\$44,982,269	1,244,820	\$36.14	\$31.48
2015-10				\$3,186,970	323,615	\$9.85	\$30.03
2015-11				\$19,625,740	725,305	\$27.06	\$29.56
2015-12				\$41,763,229	1,146,900	\$36.41	\$29.41
2016-01				-\$1,840,809	366,780	-\$5.02	\$26.60
2016-02				\$10,971,438	510,676	\$21.48	\$25.14
2016-03				\$12,167,898	908,460	\$13.39	\$11.93
2016-04				\$9,348,850	734,940	\$12.72	\$15.08
2016-05				\$10,644,050	754,184	\$14.11	\$13.41
2016-06				\$14,425,625	857,098	\$16.83	\$14.67
2016-07				-\$7,493,421	628,020	-\$11.93	\$7.85
2016-08				\$15,622,638	887,100	\$17.61	\$9.51
2016-09				\$11,628,405	848,040	\$13.71	\$8.36
2016-10				\$1,150,518	854,340	\$1.35	\$10.97
2016-11				\$12,009,221	940,140	\$12.77	\$9.38
2016-12				\$887,547	826,200	\$1.07	\$5.36
2017-01				-\$5,221,697	300,900	-\$17.35	\$3.71
2017-02				\$9,451,292	554,580	\$17.04	\$3.04
2017-03				\$17,528,763	756,300	\$23.18	\$13.50
2017-04				-\$3,455,307	180,540	-\$19.14	\$15.77

**Attachment E.1: Valcyte and Valganciclovir Manufacturer Net Sales Data**

	1	2	3	4	5	6	7
	Valcyte			Valganciclovir			
Month	Sales	Pills	Average Price per Pill	Sales	Pills	Average Price per Pill	3-Month Moving Average Price per Pill
2017-05				-\$888,311	294,960	-\$3.01	\$10.70
2017-06				\$469,940	324,888	\$1.45	\$7.21
2017-07				-\$2,903,042	250,842	-\$11.57	\$7.21
2017-08				-\$629,976	274,065	-\$2.30	\$7.21
2017-09				\$1,127,828	427,203	\$2.64	\$7.21
2017-10				-\$8,666,306	145,197	-\$59.69	\$7.21
2017-11				\$1,847,712	457,770	\$4.04	\$7.21
2017-12				\$3,315,184	456,267	\$7.27	\$7.21
2018-01				-\$863,128	241,962	-\$3.57	\$3.72
2018-02				\$1,831,066	351,705	\$5.21	\$4.08
2018-03				\$3,281,409	465,624	\$7.05	\$4.01
2018-04				-\$1,195,785	140,013	-\$8.54	\$4.09
2018-05				\$2,191,945	347,355	\$6.31	\$4.49
2018-06				\$2,164,074	395,625	\$5.47	\$3.58
2018-07				\$1,946,644	340,401	\$5.72	\$5.82
2018-08				\$918,349	303,315	\$3.03	\$4.84
2018-09				-\$171,865	250,059	-\$0.69	\$3.01
2018-10				\$323,490	213,897	\$1.51	\$1.39
2018-11				-\$231,087	131,598	-\$1.76	\$1.46
2018-12				\$1,053,349	409,758	\$2.57	\$1.52
2019-01				\$1,515,440	314,055	\$4.83	\$2.73
2019-02				\$835,937	222,828	\$3.75	\$3.60
2019-03				\$268,357	222,814	\$1.20	\$3.45
2019-04				\$449,166	244,835	\$1.83	\$2.25
2019-05				\$1,258,618	394,463	\$3.19	\$2.29
2019-06				-\$35,959	37,080	-\$0.97	\$2.47
2019-07				\$682,383	89,280	\$7.64	\$3.66
2019-08				\$226,227	62,640	\$3.61	\$4.62
2019-09				\$158,756	49,320	\$3.22	\$5.30
2019-10				\$337,836	95,400	\$3.54	\$3.49
2019-11				-\$94,458	13,680	-\$6.90	\$2.54
2019-12				\$36,386	33,120	\$1.10	\$1.97

**Attachment E.1: Valcyte and Valganciclovir Manufacturer Net Sales Data**

	1	2	3	4	5	6	7
	Valcyte			Valganciclovir			
			Average Price per Pill			Average Price per Pill	3-Month Moving Average Price per Pill
Month	Sales	Pills		Sales	Pills		

**Notes:**

- 1-2 Source: Roche transactional sales data (Exhibit 1-A-2020-05-15.xlsx, Exhibit 2-A-2020-05-15.xlsx, Exhibit 3-A-2020-05-15.xlsx, and Ex 4-AA-Reb Svc Fee.xlsx); Excludes brand-only customers: ALLERGAN, CAPITOL WHOLESALE DRUG 1460, CESAR CASTILLO, INC, F W KERR COMPANY 3300, and METRO MEDICAL SUPPLY, INC.
- 3 = Column 1 / Column 2.
- 4-5 Source: Generic manufacturer transactional sales data: Endo (ENDO\_000562, ENDO\_000564, ENDO\_000565, ENDO\_000566); Dr. Reddy's Lab (DRL (Meijer v. Ranbaxy)0003689\_HIGHLY CONFIDENTIAL, OUTSIDE ATTORNEYS EYES ONLY.xlsx); Aurobindo (Valganciclovir Chargeback Data 2016-2019.xlsx, Valganciclovir data from April 2016-March 2019 - SALES - Final.xlsx, Valganciclovir Rebate Data 2016-2019 - FINAL.xlsx, Valganciclovir Special Instructions Sales Return Data with Qty 2016-2019 - FINAL.xlsx); Hetero/Camber (HETERO00000059-HETERO00000060).
- 6 = Column 4 / Column 5.
- 7 = Prior three month sum from Column 4 / prior three month sum for Column 5.
- Since the data show negative prices, from June 2017 through December 2017 and November 2018, prices are calculated as the average of the prices found in adjacent months.



**Attachment E.2: Valcyte and Valganciclovir Yardstick Calculations - Scenario 1**

	1	2	3	4	5	6	7	8	9	10
	Valcyte		Valganciclovir		Yardstick Inputs			But-For Yardsticks		
Month	Average Price per Pills	Pill	3-Month Moving Average Pills	Price per Pill	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline
2014-07										
2014-08								2	43.9%	-33.9%
2014-09								2	66.6%	-37.3%
2014-10								2	79.3%	-45.1%
2014-11					1	43.9%	-21.2%	2	80.0%	-50.6%
2014-12			776,160	\$42.06	2	66.6%	-33.9%	2	83.0%	-59.7%
2015-01			649,380	\$39.85	2	79.3%	-37.3%	2	70.1%	-58.7%
2015-02			614,760	\$34.92	2	80.0%	-45.1%	2	81.5%	-52.2%
2015-03			844,140	\$31.40	2	83.0%	-50.6%	2	87.7%	-49.0%
2015-04			427,220	\$25.63	2	70.1%	-59.7%	2	78.7%	-51.0%
2015-05			689,445	\$26.24	2	81.5%	-58.7%	2	83.8%	-50.5%
2015-06			1,055,340	\$30.42	2	87.7%	-52.2%	2	88.5%	-52.8%
2015-07			470,880	\$32.43	2	78.7%	-49.0%	2	78.3%	-53.5%
2015-08			645,697	\$31.17	2	83.8%	-51.0%	2	88.9%	-53.7%
2015-09			1,244,820	\$31.48	2	88.5%	-50.5%	2	91.3%	-58.2%
2015-10			323,615	\$30.03	2	78.3%	-52.8%	2	77.3%	-60.5%
2015-11			725,305	\$29.56	2	88.9%	-53.5%	2	84.4%	-60.5%
2015-12			1,146,900	\$29.41	2	91.3%	-53.7%	2	88.9%	-60.5%
2016-01			366,780	\$26.60	2	77.3%	-58.2%	2	86.7%	-60.5%
2016-02			510,676	\$25.14	2	84.4%	-60.5%	2	88.8%	-60.5%
2016-03			908,460	\$11.93	3	88.9%	-81.2%	3	88.5%	-81.2%
2016-04			734,940	\$15.08	4	86.7%	-76.3%	4	88.4%	-76.3%
2016-05			754,184	\$13.41	4	88.8%	-78.9%	4	90.8%	-78.9%
2016-06			857,098	\$14.67	4	88.5%	-76.9%	4	89.9%	-76.9%
2016-07			628,020	\$7.85	4	88.4%	-87.7%	4	90.7%	-87.7%
2016-08			887,100	\$9.51	4	90.8%	-85.0%	4	91.3%	-85.0%
2016-09			848,040	\$8.36	4	89.9%	-86.9%	4	90.2%	-86.9%
2016-10			854,340	\$10.97	4	90.7%	-82.8%	4	90.2%	-82.8%
2016-11			940,140	\$9.38	4	91.3%	-85.2%	4	90.2%	-85.2%
2016-12			826,200	\$5.36	4	90.2%	-91.6%	4	90.2%	-91.6%
2017-01			300,900	\$3.71	4		-94.2%	4	90.2%	-94.2%
2017-02			554,580	\$3.04	4		-95.2%	4	90.2%	-95.2%
2017-03			756,300	\$13.50	4		-78.8%	4	90.2%	-78.8%
2017-04			180,540	\$15.77	4		-75.2%	4	90.2%	-75.2%

**Attachment E.2: Valcyte and Valganciclovir Yardstick Calculations - Scenario 1**

	1	2	3	4	5	6	7	8	9	10
	Valcyte		Valganciclovir		Yardstick Inputs			But-For Yardsticks		
Month	Average Price per Pills	Pill	3-Month Moving Average Pills	Price per Pill	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline
2017-05			294,960	\$10.70	4		-83.2%	4	90.2%	-83.2%
2017-06			324,888	\$7.21	4		-88.7%	4	90.2%	-88.7%
2017-07			250,842	\$7.21	4		-88.7%	4	90.2%	-88.7%
2017-08			274,065	\$7.21	4		-88.7%	4	90.2%	-88.7%
2017-09			427,203	\$7.21	4		-88.7%	4	90.2%	-88.7%
2017-10			145,197	\$7.21	4		-88.7%	4	90.2%	-88.7%
2017-11			457,770	\$7.21	4		-88.7%	4	90.2%	-88.7%
2017-12			456,267	\$7.21	4		-88.7%	4	90.2%	-88.7%
2018-01			241,962	\$3.72	4		-94.2%	4	90.2%	-94.2%
2018-02			351,705	\$4.08	4		-93.6%	4	90.2%	-93.6%
2018-03			465,624	\$4.01	4		-93.7%	4	90.2%	-93.7%
2018-04			140,013	\$4.09	4		-93.6%	4	90.2%	-93.6%
2018-05			347,355	\$4.49	4		-92.9%	4	90.2%	-92.9%
2018-06			395,625	\$3.58	4		-94.4%	4	90.2%	-94.4%
2018-07			340,401	\$5.82	4		-90.9%	4	90.2%	-90.9%
2018-08			303,315	\$4.84	4		-92.4%	4	90.2%	-92.4%
2018-09			250,059	\$3.01	4		-95.3%	4	90.2%	-95.3%
2018-10			213,897	\$1.39	4		-97.8%	4	90.2%	-97.8%
2018-11			131,598	\$1.46	4		-97.7%	4	90.2%	-97.7%
2018-12			409,758	\$1.52	4		-97.6%	4	90.2%	-97.6%
2019-01			314,055	\$2.73	4		-95.7%	4	90.2%	-95.7%
2019-02			222,828	\$3.60	4		-94.3%	4	90.2%	-94.3%
2019-03			222,814	\$3.45	4		-94.6%	4	90.2%	-94.6%
2019-04			244,835	\$2.25	4		-96.5%	4	90.2%	-96.5%
2019-05			394,463	\$2.29	4		-96.4%	4	90.2%	-96.4%
2019-06			37,080	\$2.47	4		-96.1%	4	90.2%	-96.1%
2019-07			89,280	\$3.66	4		-94.2%	4	90.2%	-94.2%
2019-08			62,640	\$4.62	4		-92.7%	4	90.2%	-92.7%
2019-09			49,320	\$5.30	4		-91.7%	4	90.2%	-91.7%
2019-10			95,400	\$3.49	4		-94.5%	4	90.2%	-94.5%
2019-11			13,680	\$2.54	4		-96.0%	4	90.2%	-96.0%
2019-12			33,120	\$1.97	4		-96.9%	4	90.2%	-96.9%

**Attachment E.2: Valcyte and Valganciclovir Yardstick Calculations - Scenario 1**

	1	2	3	4	5	6	7	8	9	10
	Valcyte		Valganciclovir		Yardstick Inputs			But-For Yardsticks		
Month	Average Price per Pills	Pill	3-Month Moving Average Pills	Price per Pill	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline

## Notes:

- 1 = E.1 Column 2.
- 2 = E.1 Column 3.
- 3 = E.1 Column 5.
- 4 = E.1 Column 7.
- 5 Count of generic manufacturers that launched in the actual world, based on the produced manufacturer sales data.
- 6 = Column 3 / (Column 1 + Column 3).
- 7 = (Column 2 - Column 2 in October 2014) / (Column 2 in October 2014).
- 8 Count of generic manufacturers that would have launched in the but-for world according to the but-for Scenario.
- 9 = Column 6, beginning in August 2014. Due to lack of data, from October 2016 onward set equal to September 2016.
- 10 From August 2014 to October 2015, set equal to Column 7 starting in December 2014.  
November 2015 to February 2016 are set equal to October 2015.  
From March 2016 onward, set equal to Column 7 from March 2016 onward.

## Attachment E.3: Valcyte and Valganciclovir Direct Purchaser Overcharges - Scenario 1

	1	2	3	4	5	6	7	8	9	10	11	12	13
	Actual				But-For Yardsticks			But-For			Overcharges		
Month	Valcyte Pills	Valcyte Average Price per Pill	Valganciclovir Pills	Valganciclovir 3- Month Moving Average Price per Pill	No. of Gen. Manuf.	Generic Market Share	Generic Price Decline	Valcyte Pills	Valganciclovir Pills	Valganciclovir Price per Pill	Brand- Generic	Generic- Generic	Total
2014-07													
2014-08					2	43.9%	-33.9%	413,412	323,268	\$41.74	\$7,323,018		\$7,323,018
2014-09					2	66.6%	-37.3%	256,531	510,929	\$39.56	\$12,690,806		\$12,690,806
2014-10					2	79.3%	-45.1%	179,116	684,764	\$34.66	\$19,809,933		\$19,809,933
2014-11					2	80.0%	-50.6%	219,624	879,696	\$31.16	\$13,203,069	\$9,127,943	\$22,331,011
2014-12			776,160	\$42.06	2	83.0%	-59.7%	198,048	967,812	\$25.44	\$7,424,632	\$12,900,407	\$20,325,039
2015-01			649,380	\$39.85	2	70.1%	-58.7%	244,893	574,347	\$26.04	\$0	\$8,969,397	\$8,969,397
2015-02			614,760	\$34.92	2	81.5%	-52.2%	142,465	625,775	\$30.19	\$318,281	\$2,902,794	\$3,221,076
2015-03			844,140	\$31.40	2	87.7%	-49.0%	124,815	892,065	\$32.18	\$1,417,664	\$0	\$1,417,664
2015-04			427,220	\$25.63	2	78.7%	-51.0%	129,555	479,825	\$30.94	\$1,755,568	\$0	\$1,755,568
2015-05			689,445	\$26.24	2	83.8%	-50.5%	137,316	709,089	\$31.24	\$678,268	\$0	\$678,268
2015-06			1,055,340	\$30.42	2	88.5%	-52.8%	138,393	1,064,607	\$29.81	\$346,990	\$648,234	\$995,224
2015-07			470,880	\$32.43	2	78.3%	-53.5%	129,990	468,030	\$29.34	\$0	\$1,455,029	\$1,455,029
2015-08			645,697	\$31.17	2	88.9%	-53.7%	85,685	685,052	\$29.19	\$1,517,486	\$1,277,704	\$2,795,190
2015-09			1,244,820	\$31.48	2	91.3%	-58.2%	122,778	1,283,862	\$26.40	\$1,657,112	\$6,320,648	\$7,977,760
2015-10			323,615	\$30.03	2	77.3%	-60.5%	93,857	319,638	\$24.95	\$0	\$1,642,551	\$1,642,551
2015-11			725,305	\$29.56	2	84.4%	-60.5%	127,425	688,600	\$24.95	\$0	\$3,338,555	\$3,338,555
2015-12			1,146,900	\$29.41	2	88.9%	-60.5%	139,710	1,116,870	\$24.95	\$0	\$5,109,466	\$5,109,466
2016-01			366,780	\$26.60	2	86.7%	-60.5%	63,251	411,229	\$24.95	\$2,046,313	\$602,435	\$2,648,747
2016-02			510,676	\$25.14	2	88.8%	-60.5%	67,652	537,524	\$24.95	\$1,223,390	\$95,603	\$1,318,994

Total \$71,412,532 \$54,390,766 \$125,803,298

## Notes:

- 1 = E.1 Column 2.
- 2 = E.1 Column 3.
- 3 = E.1 Column 5.
- 4 = E.1 Column 7.
- 5 = E.2 Column 8.
- 6 = E.2 Column 9.
- 7 = E.2 Column 10.
- 8 = (Column 1 + Column 3) \* (1 - Column 6).
- 9 = (Column 1 + Column 3) \* Column 6.
- 10 = Column 2 in July 2014 \* (1 + Column 7).
- 11 = (Column 9 - Column 3) \* (Column 2 - Column 10). If Column 3 > Column 9, set to zero.
- 12 = Column 3 \* (Column 4 - Column 10). If negative, set to zero.
- 13 = Column 11 + Column 12.

**Attachment F**

